FOR YOUR SAFETY
If you smell gas:

1. **Open windows.**
2. **DO NOT try to light any appliance.**
3. **DO NOT use electrical switches.**
4. **DO NOT use any telephone in your building.**
5. **Extinguish any open flame.**
6. **Leave the building.**
7. **Immediately call your local gas supplier after leaving the building. Follow the gas supplier's instructions.**
8. **If you cannot reach your gas supplier, call the Fire Department.**

⚠ WARNING

Fire Hazard

Keep all flammable objects, liquids and vapors the minimum required clearances to combustibles away from heater.

Some objects will catch fire or explode when placed close to heater.

Failure to follow these instructions can result in death, injury or property damage.

⚠ WARNING

Improper installation, adjustment, alteration, service or maintenance can result in death, injury or property damage. Read the Installation, Operation and Service Manual thoroughly before installing or servicing this equipment.

Installation must be done by a contractor qualified in the installation and service of gas-fired heating equipment or your gas supplier.

ROBERTS GORDON

Combat®

UHD-Series Tubular Duct Furnace (Standard Range)

Installation, Operation & Service Manual

Models UHD[T][M][X][S][R] 150, 175, 200, 225 250, 300, 350, 400

Installer

Please take the time to read and understand these instructions prior to any installation. Installer must give a copy of this manual to the owner.

Owner

Keep this manual in a safe place in order to provide your service technician with necessary information.

Roberts-Gordon LLC
1250 William Street
P.O. Box 44
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www.rg-inc.com

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P/N 113001NA 11/14 Rev E

POUR VOTRE SECURITE
Si vous sentez une odeur de gaz:

1. **Ouvrir les fenêtres.**
2. **N'essayer pas d'allumer un appareil.**
3. **N'utiliser pas d'interrupteurs électriques.**
4. **N'utiliser pas de téléphone dans votre bâtiment.**
5. **Eteindre flamme nue.**
6. **Quitter le bâtiment.**
7. **Après avoir quitté le bâtiment, appelez immédiatement votre fournisseur local de gaz.**
   Suivre les instructions du fournisseur de gaz.
8. **Si vous ne pouvez pas joindre votre fournisseur de gaz, appeler le service d'incendie.**

⚠AVERTISSEMENT

Risque d'incendie

Garder tous les objets, liquides ou vapeurs inflammables à la distance minimale de l'unité de chauffage requise avec les matériaux combustibles.

Certains objets prendront feu ou exploseront s'ils sont placés à proximité de l'unité de chauffage.

Le non respect de ces instructions peut entraîner la mort, des blessures corporelles ou des dommages matériels.

⚠ AVERTISSEMENT

L'installation, le réglage, la modification, la réparation ou la maintenance inadapté peut entraîner la mort, des blessures ou des dommages matériels. Lire attentivement le manuel d'installation, d'utilisation et d'entretien avant d'installer ou de réparer cet équipement.

L'installation doit être effectuée par un entrepreneur qualifié dans l'installation et l'entretien d'appareils de chauffage au gaz ou par votre fournisseur de gaz.

ROBERTS GORDON

Combat®

UHD-Series Appareil de chauffage conduit à échangeur tubulaire (Gamme standard)

Manuel d'installation, d'operation, et de service

Modèles UHD[T][M][X][S][R] 150, 175, 200, 225 250, 300, 350, 400

Installateur

Vouloir prendre le temps de lire et de comprendre ces instructions avant toute installation. L'installateur doit donner un exemplaire de ce manuel au propriétaire.

Propriétaire

Garder ce manuel dans un endroit sûr pour fournir les informations nécessaires au personnel d'entretien.

Roberts-Gordon LLC
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P/N 113001FC 11/14 Rev E

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Printed in U.S.A.

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SECTION 1: HEATER SAFETY

Your Safety is Important to Us!
This symbol is used throughout the manual to notify you of possible fire, electrical or burn hazards. Please pay special attention when reading and following the warnings in these sections.
Installation, service and, at a minimum, annual inspection of heater must be done by a contractor qualified in the installation and service of gas-fired heating equipment.
Read this manual carefully before installation, operation or service of this equipment.
Heaters are not approved for residential installation.
These instructions, the layout drawing, local codes and ordinances and applicable standards that apply to gas piping, electrical wiring, venting, etc. must be thoroughly understood before proceeding with the installation.

Protective gear is to be worn during installation, operation and service in accordance to the Occupational Safety and Health Administration (OSHA). Gear must be in accordance to NFPA 70E, latest revision when working with electrical components. Thin sheet metal parts, including the various venting components, have sharp edges. To prevent injury, the use of work gloves is recommended.

Before installation, check that the local distribution conditions, nature of gas and pressure and adjustment of the equipment are compatible.

This heater must be applied and operated under the general concepts of reasonable use and installed using the best building practices.
This equipment is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the equipment by a person responsible for their safety. Children should be supervised to ensure that they do not play with the equipment.
For additional copies of the Installation, Operation and Service Manual, please contact Roberts-Gordon LLC.

1.1 Manpower Requirements

To prevent personal injury and damage to the heater, two persons will be required for installation.

1.2 Safety Labels and Their Placement

Product safety signs or labels should be replaced by the product user when they are no longer legible. Please contact Roberts-Gordon LLC or your ROBERTS GORDON® independent distributor to obtain replacement signs or labels. *See Page 2, Figure 1 through Page 4, Figure 3*.

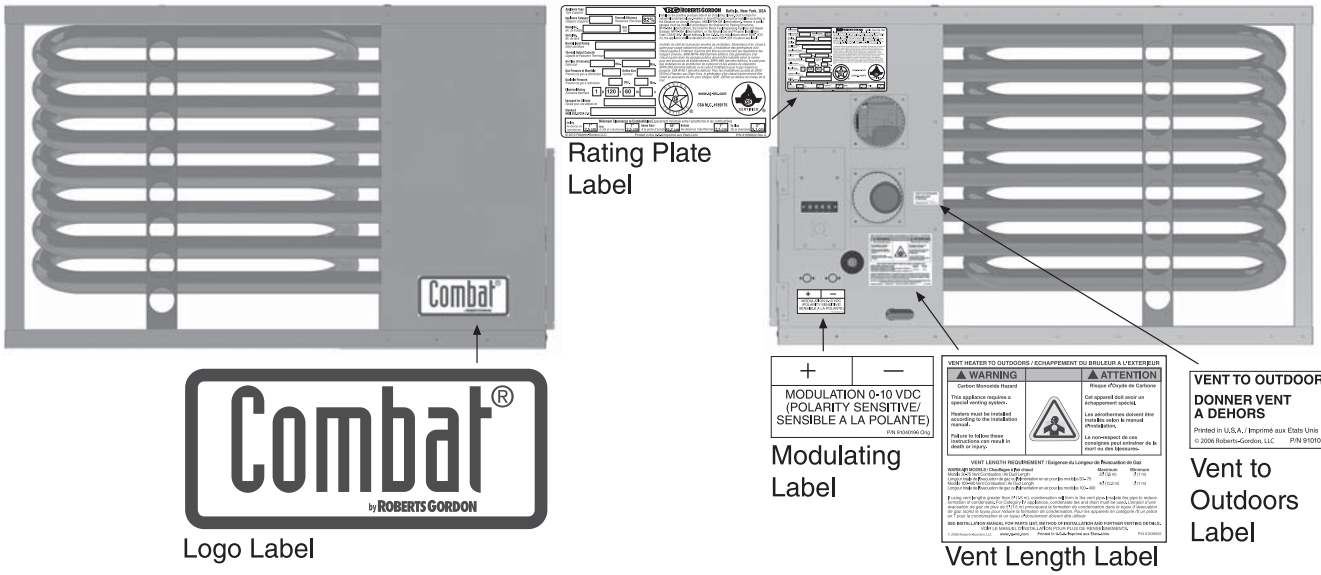
1.3 California Proposition 65

In accordance with California Proposition 65 requirements, a warning label must be placed in a highly visible location on the outside of the equipment (i.e. near equipment's serial plate). See label placement drawing *on Page 2, Figure 1 through Page 4, Figure 3* for label location. Avoid placing label on areas with extreme heat, cold, corrosive chemicals or other elements. To order additional labels, please contact Roberts-Gordon LLC or your ROBERTS GORDON® independent distributor.

Figure 1: UHD[T][M][X][S][R] 150-175 Label Placement

FRONT VIEW

BACK VIEW



Logo Label

Rating Plate Label

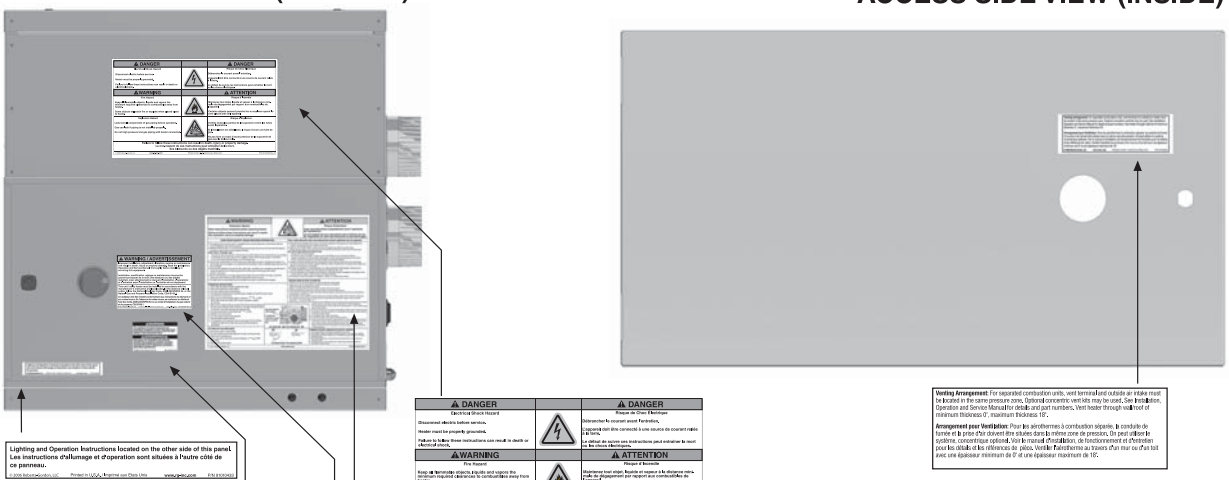
Modulating Label

Vent Length Label

Vent to Outdoors Label

ACCESS SIDE VIEW (OUTSIDE)

ACCESS SIDE VIEW (INSIDE)



Instruction Location Label

Warning Label

Proposition 65 Label

Lighting Instructions Label

Installation Label

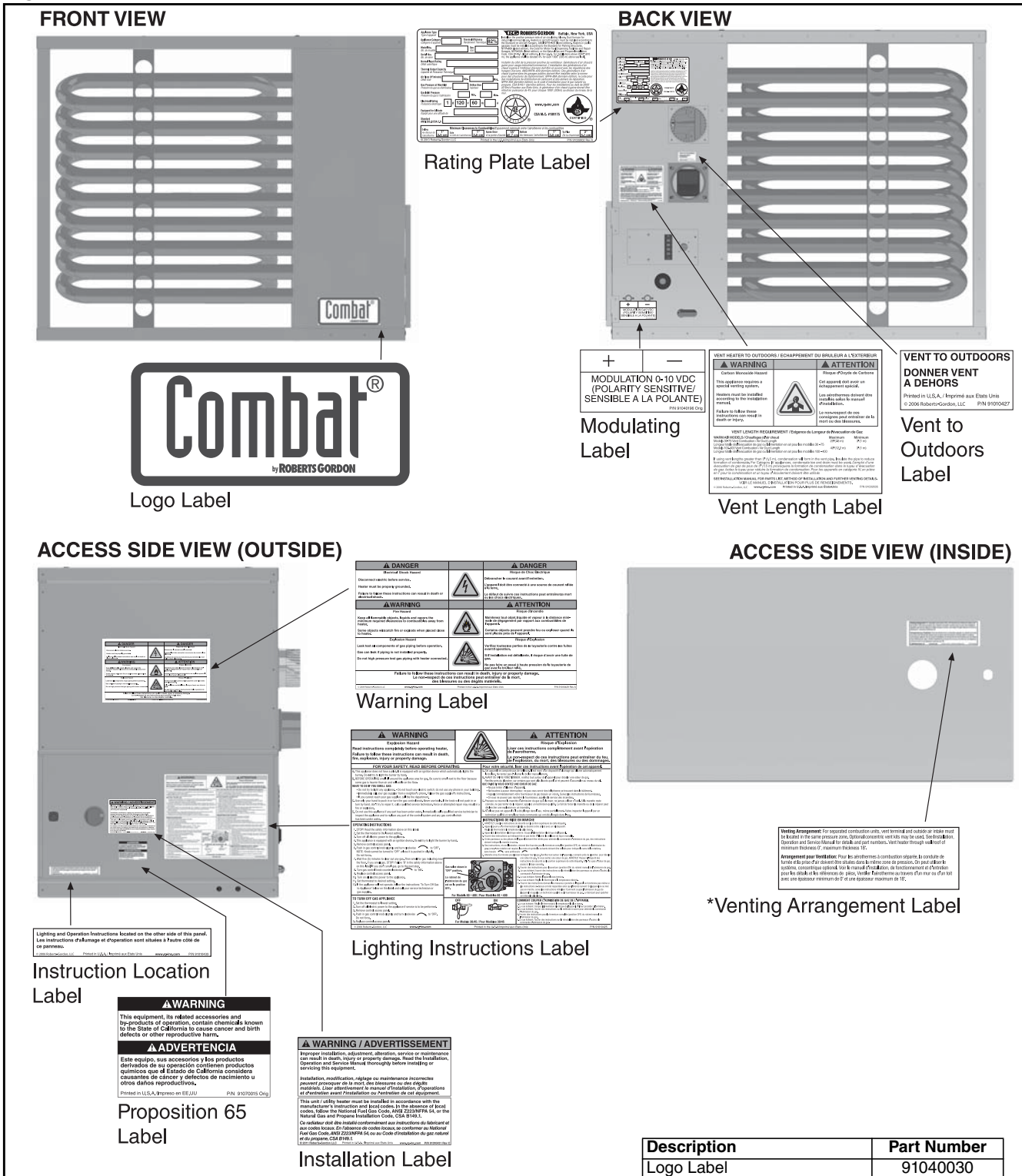
*Venting Arrangement Label

Description	Part Number
Logo Label	91040030
Vent Length Label	91039505
Vent to Outdoors Label	91010427
Warning Label	91010429
Rating Plate Label	91039802
Installation Label	91010431
Instruction Location Label	91010433
Lighting Instruction Label	91010425
Venting Arrangement Label*	91010426
Proposition 65 Label	91070015
0-10VDC Modulating Label**	91040196

* For separated combustion units only

** For modulating units only

Figure 2: UHD[T][M][X][S][R] 200-250 Label Placement

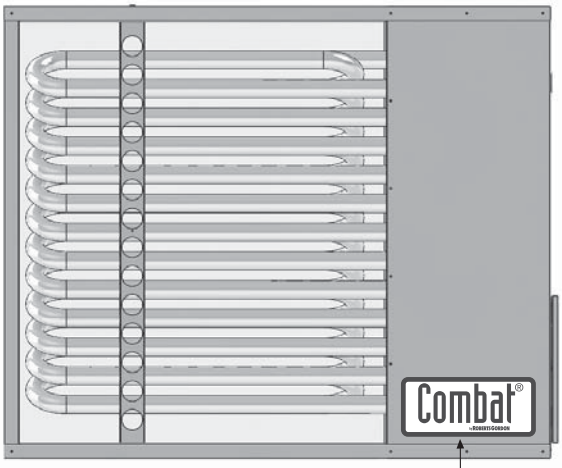


Description	Part Number
Logo Label	91040030
Vent Length Label	91039505
Vent to Outdoors Label	91010427
Warning Label	91010429
Rating Plate Label	91039802
Installation Label	91010431
Instruction Location Label	91010433
Lighting Instruction Label	91010425
Venting Arrangement Label*	91010426
Proposition 65 Label	91070015
0-10VDC Modulating Label**	91040196

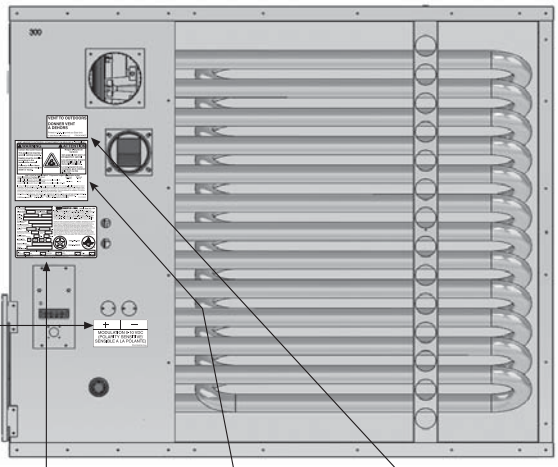
* For separated combustion units only
** For modulating units only

Figure 3: UHD[T][M][X][S][R] 300 – 400 Label Placement

FRONT VIEW



BACK VIEW



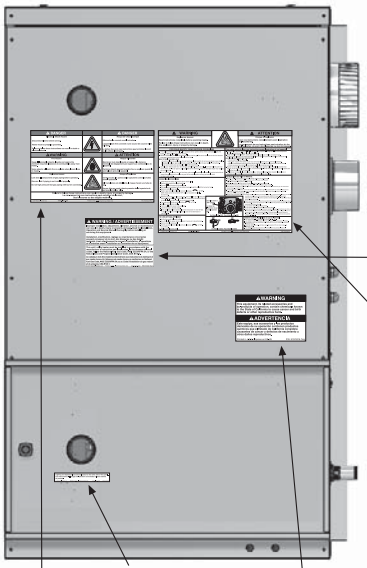
Logo Label

Rating Plate Label

Vent Length Label

Vent to Outdoors Label

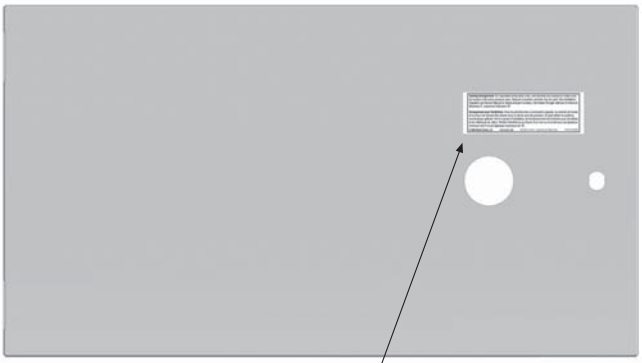
ACCESS SIDE VIEW (OUTSIDE)



Modulating Label

Installation Label

ACCESS SIDE VIEW (INSIDE)



*Venting Arrangement Label

Instruction Location Label

Lighting Instructions Label

Proposition 65 Label

Warning Label

Description	Part Number
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Venting Arrangement Label*	91010426
Proposition 65 Label	91070015
0-10VDC Modulating Label**	91040196

* For separated combustion units only

** For modulating units only

SECTION 2: INSTALLER RESPONSIBILITY

The installer is responsible for the following:

- To install the heater, as well as the gas and electrical supplies, in accordance with applicable specifications and codes. Roberts-Gordon LLC recommends the installer contact a Local Building Inspector or Fire Marshal for guidance.
- To use the information given in a layout drawing and in the manual together with the cited codes and regulations to perform the installation.
- To install the heater in accordance with the clearances to combustibles.
- To furnish all needed materials not supplied as standard equipment.
- To plan location of supports, vents and air intakes.
- To provide access for servicing.
- To provide the owner with a copy of this Installation, Operation and Service Manual.
- To never use heater as support for a ladder or other access equipment and never hang or suspend anything from heater.
- To ensure there is adequate air circulation around the heater and to supply air for combustion, ventilation and distribution in accordance with local codes.
- To provide a method that ensures that the air flow through the heat exchanger is within the acceptable range indicated on the serial plate prior to energizing the heater, and that such air flow continues at least 90 seconds after the heater is de-energized.
- To ensure the heater is placed in an approved application.

2.1 Wall Tag

A laminated wall tag is included with the heater as a permanent reminder of the safety instructions and the importance of the required clearances to combustibles. Affix the tag by peeling off the backing of the adhesive strips on the rear surface and position the tag on a wall near the heater.

A copy of the wall tag (P/N 91039831) is illustrated on the back cover.

Know your model number and installed configuration. Model number and installed configuration are found on the heater serial plate and throughout the Installation, Operation and Service Manual.

2.2 Corrosive Chemicals

⚠ CAUTION

Product Damage Hazard

Do not use equipment in area containing corrosive chemicals.

Refer to appropriate Material Safety Data Sheets (MSDS).

Failure to follow these instructions can result in product damage.

Roberts-Gordon LLC cannot be responsible for ensuring that all appropriate safety measures are undertaken prior to installation; this is entirely the responsibility of the installer. It is essential that the contractor, the sub-contractor, or the owner identifies the presence of combustible materials, corrosive chemicals or halogenated hydrocarbons* anywhere in the premises.

** **Halogenated Hydrocarbons** are a family of chemical compounds characterized by the presence of halogen elements (fluorine, chlorine, bromine, etc.). These compounds are frequently used in refrigerants, cleaning agents, solvents, etc. If these compounds enter the air supply of the burner, the life span of the heater components will be greatly reduced. An outside air supply must be provided to the burners whenever the presence of these compounds is suspected. Warranty will be invalid if the heater is exposed to halogenated hydrocarbons.*

2.3 National Standards and Applicable Codes

All equipment must be installed in accordance with the latest revision of the applicable standards and national codes. This refers also to the electric, gas and venting installation. Note: Additional standards for installations in public garages, aircraft hangars, etc. may be applicable. *See Page 8, Section 5*.

SECTION 3: CRITICAL CONSIDERATIONS

3.1 Basic Information

UHD[T][M][X][S][R] heaters have automatic ignition burners for ON/OFF, HIGH/LOW or modulate within the range of HIGH/LOW operation.

3.2 Manufactured Units

Gas-fired, power-vented duct furnace with tubular heat exchanger. Units shall have a minimum of 82% thermal efficiency. The standard unit shall consist of a non-separated combustion design with an aluminized heat exchanger and a single stage gas valve. Design and heat exchanger alternatives shall be offered as follows:

- Separated Combustion: [S] A separated combustion unit shall consist of a sealed enclosure with a hinged door. Combustion air inlet on rear of heater allows for intake venting from outside of heated space to be attached. Combustion flue gases shall be ducted from outside heated space by ductwork connected to unit's outlet flange.
- Stainless Steel Heat Exchanger: [X] A stainless steel heat exchanger unit shall consist of heat exchanger tubes, heat exchanger tube supports and heat exchanger tube plate produced of 409 stainless steel. Air inlet temperatures below 40° F (4.4° C) are not recommended for this application.
- Two Stage Gas Valve: [T] A two stage gas valve shall allow heater to function in either high or low operation.
- Modulating Gas Valve: [M] A modulating gas valve shall allow heater to modulate between high and low fire.
- Approved for Installation Downstream of a Refrigeration System: [R] Installation allows for unit to be installed downstream of a refrigeration system. Unit design shall include a 409 stainless steel package. Stainless steel package includes heat exchanger, tube supports and drip pan.

3.3 Location and Suspension

All models:

- Must be installed indoors.
- Must be installed on the positive pressure side of the air circulation blower.
- Must be installed in a level position with horizontal discharge.
- May be mounted on a shelf of non-combustible material.
- May be suspended from above (*See Page 10, Section 6.2*) or from wall brackets of sufficient strength to support the heater as listed in the Technical Data Table *on Page 51, Section 16.2 and Page 53, Section 16.5*.
- Drop rods must be a minimum of 3/8" diameter mild steel. Four suspension points (3/8" nuts) are located on top of the heater.
- Must be installed in a manner which allows access to all serviceable components.

3.4 Minimum Required Installation Clearances

Clearances around the heater and vent must be as indicated *on Page 7, Figure 4* and *Page 11, Section 7* to ensure access for servicing and correct operation.

3.5 Ventilation

It is important to ensure that there is adequate air space around the heater to supply air for combustion, ventilation and distribution in accordance with local and national code *on Page 11, Section 7*.

3.6 Gas Supply

It is important that the gas supply pipe is sized correctly to provide the inlet pressure as stated on the heater data plate. The gas supply pipe and electrical connections must not support any of the heater's weight. *See Page 18, Section 9*.

3.7 Electrical Supply

A permanent 120 V / 1 Ø / 60 Hz electrical supply is required for the main electrical power. The heater also requires suitable controls listed *on Page 20, Section 10*.

3.8 Vent

Choose heater orientation to allow for proper location of the vent. Each heater must be fitted with a correctly sized sealed vent system.

If vented horizontally, no other equipment may be connected to the vent. *See Page 11, Section 7*.

SECTION 4: CLEARANCES TO COMBUSTIBLES

4.1 Required Clearances to Combustibles

⚠WARNING

Fire Hazard

Keep all flammable objects, liquids and vapors the minimum required clearances to combustibles away from heater.

Some objects will catch fire or explode when placed close to heater.

Failure to follow these instructions can result in death, injury or property damage.

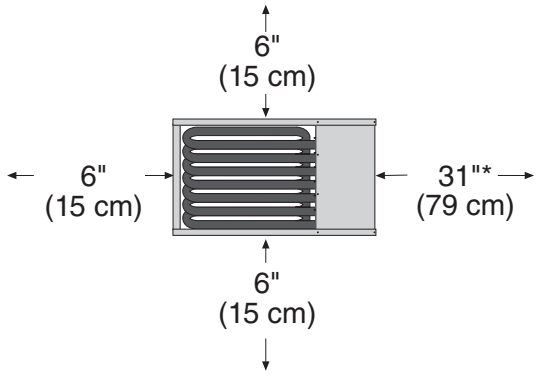
Clearances are the required distances that combustible objects must be away from the heater to prevent a fire hazard. Combustibles are materials that may catch on fire and include common items such as wood, paper, rubber, fabric, etc. Maintain clearances to combustibles at all times for safety. Clearances for all heater models are located on the serial plate, wall tag and throughout the manual. Check the clearances on the serial plate to make sure the product is suitable for your application and the clearances are maintained. Read and follow the safety guidelines below:

- Keep gasoline or other combustible material including flammable objects, liquids, dust or vapors away from this heater or any other equipment.
- Do not spray aerosols in the vicinity of this heater.
- The stated clearances to combustibles represents a surface temperature of 90° F (50° C) above room temperature. Building materials with a low heat tolerance (such as plastics, vinyl siding, canvas, tri-ply, etc.) may be subject to degradation at lower temperatures. It is the installer's and owner's responsibility to assure that adjacent materials are protected from degradation.
- Maintain clearances from heat sensitive equipment and work stations.
- Consult local Fire Marshal, Fire Insurance Carrier or other authorities for approval of proposed installation when there is a possibility of exposure to combustible airborne materials or vapors.

4.2 Clearances to Combustibles

Clearances must be as indicated *on Page 7, Figure 4*. If clearances to combustibles are not indicated, then installation clearances apply.
All distances are minimum clearance requirements for service access, air flow and safety.

Figure 4: Clearances to Combustibles



Clearance to Vent: 2" (5 cm)

*31" (79 cm) minimum is necessary for servicing.

SECTION 5: NATIONAL STANDARDS AND APPLICABLE CODES

5.1 Gas Codes

The type of gas appearing on the serial plate must be the type of gas used. Installation must comply with national and local codes and requirements of the local gas company.

United States: Refer to NFPA 54/ANSI Z223.1 - latest revision, National Fuel Gas Code.

Canada: Refer to CSA B149.1 Natural Gas and Propane Installation Code.

5.2 Aircraft Hangars

Installation in aircraft hangars must be in accordance with the following codes:

United States: Refer to Standard for Aircraft Hangars, NFPA 409 - latest revision.

Canada: Refer to Natural Gas and Propane Installation Code, Standard CSA B149.1 - latest revision.

5.3 Parking Structures and Repair Garages

Installation in garages must be in accordance with the following codes:

United States: Refer to Standard for Parking Structures, NFPA 88A - latest revision or the Code for Motor Fuel Dispensing Facilities and Repair Garages, NFPA 30A - latest revision.

Canada: Refer to Natural Gas and Propane Installation Code, Standard CSA B149.1 - latest revision.

5.4 Electrical

The heater must be electrically grounded in accordance with the following codes:

United States: Refer to National Electrical Code®, NFPA 70 - latest revision. Wiring must conform to the most current National Electrical Code®, local ordinances and any special diagrams furnished.

Canada: Refer to Canadian Electrical Code, CSA C22.1 Part 1 - latest revision.

5.5 Venting

The venting must be installed in accordance with the requirements within this manual and the following codes:

United States: Refer to NFPA 54/ANSI Z223.1 - latest revision, National Fuel Gas Code.

Canada: Refer to CSA B149.1 Natural Gas and Propane Installation Code.

5.6 High Altitude

These heaters are approved (without modifications) for installations up to 2000' (610 m) in US and Canada. Heaters installed above 2000' (610 m) must be de-rated. For installations above 2000' (610 m) in US, consult factory for information on burner de-rating. For installations from 2000' (610 m) to 4500' (1370m) in Canada, high altitude conversion kits are available. Heaters installed over 4500' (1370 m) in Canada are not approved and must be approved by the local or provincial authority.

SECTION 6: DUCT HEATER INSTALLATION

6.1 General

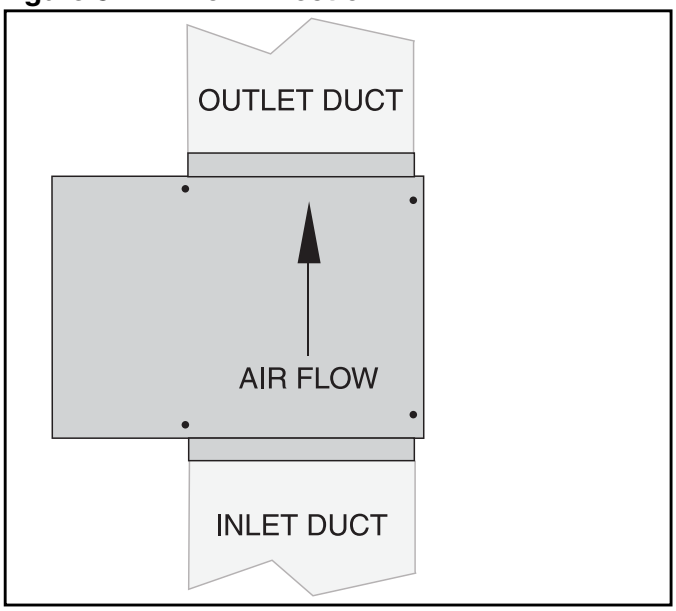
To connect the inlet and outlet ducts to the heater, Duct-Mate or similar flanges may be slid over the duct connector flanges supplied on the unit and secured with screws. The connection to the duct then can be made using the Duct-Mate clips. The ducts must have removable access panels upstream and downstream of the heater. These panels must be of appropriate size and placement so that smoke or reflected light could be observed to indicate the presence of leaks in the heat exchanger. Covers for these openings should be sealed to prevent leakage.

Any transition into the inlet of the heater should be smooth, with a taper of no more than 15 degrees. If elbows are required, they should be of either broad radius or fitted with properly designed turning vanes. Consult a professional to ensure turning vanes are properly designed.

The heater must be installed on the positive pressure side of the circulating air blower. Air flow through the heater must be as shown *on Page 9, Figure 5* and may not be reversed. The air flow must be adjusted such that it is within the acceptable range shown *on Page 9, Section 6.1.2*.

The minimum inlet duct lengths shown *on Page 9, Section 6.1.1* must be observed. Pressure drop through the heat exchanger at various air flows is shown *on Page 9, Section 6.1.2*.

Figure 5: Air Flow Direction



6.1.1 Minimum Inlet Duct Length

Model	Duct Length	Duct Size (W X H)
UHD[T][M][X][S][R] 150-175	52" (132 cm)	28" x 24" (71 cm x 60 cm)
UHD[T][M][X][S][R] 200-250	60" (162 cm)	28" x 32 1/2" (71 cm x 83 cm)
UHD[T][M][X][S][R] 300-400	75" (190 cm)	35" x 40 1/2" (89 cm x 82 cm)

6.1.2 Temperature Rise and Pressure Drop Ranges

UHD[T][M][X][S][R] 150			UHD[T][M][X][S][R] 175			UHD[T][M][X][S][R] 200			UHD[T][M][X][S][R] 225		
Airflow (CFM)	Temperature Rise (°F)	Pressure Drop (in wc)	Airflow (CFM)	Temperature Rise (°F)	Pressure Drop (in wc)	Airflow (CFM)	Temperature Rise (°F)	Pressure Drop (in wc)	Airflow (CFM)	Temperature Rise (°F)	Pressure Drop (in wc)
1,360	83	0.02	1,400	95	0.03	2,050	73	0.025	2,100	80	0.035
1,950	58	0.035	2,180	62	0.06	2,600	58	0.035	2,800	61	0.052
2,800	41	0.057	3,244	42	0.10	3,600	42	0.056	4,600	37	0.110
3,700	31	0.083	4,370	31	0.15	5,500	28	0.100	6,230	27	0.167
4,700	24	0.12	5,160	27	0.19	6,570	23.5	0.129	7,400	23	0.214
5,800	20	0.16	6,850	20	0.29	7,750	20	0.163	8,300	20	0.253

UHD[T][M][X][S][R] 250			UHD[T][M][X][S][R] 300			UHD[T][M][X][S][R] 350			UHD[T][M][X][S][R] 400		
Airflow (CFM)	Temperature Rise (°F)	Pressure Drop (in wc)	Airflow (CFM)	Temperature Rise (°F)	Pressure Drop (in wc)	Airflow (CFM)	Temperature Rise (°F)	Pressure Drop (in wc)	Airflow (CFM)	Temperature Rise (°F)	Pressure Drop (in wc)
2,350	80	0.05	2,700	86	0.02	3,120	86	0.03	3,420	86	0.04
3,000	63	0.07	4,735	50	0.06	4,880	56	0.07	5,200	57	0.08
4,400	43	0.13	6,813	35	0.12	6,612	41	0.123	6,700	45	0.13
5,900	32	0.19	8,000	30	0.17	9,140	30	0.23	8,850	34	0.21
7,625	25	0.28	9,300	26	0.22	10,500	26	0.30	11,600	26	0.36
8,850	22	0.35	10,200	23	0.27	13,600	22	0.48	14,200	22	0.53

6.2 Suspension

⚠ WARNING

Crush Hazard

Use 3/8" threaded rod minimum.

Failure to follow these instructions can result in death, injury or property damage.

For typical suspension, *See Page 10, Figure 6*. When handling or supporting the heater from below, ensure that the weight is taken at the support points.

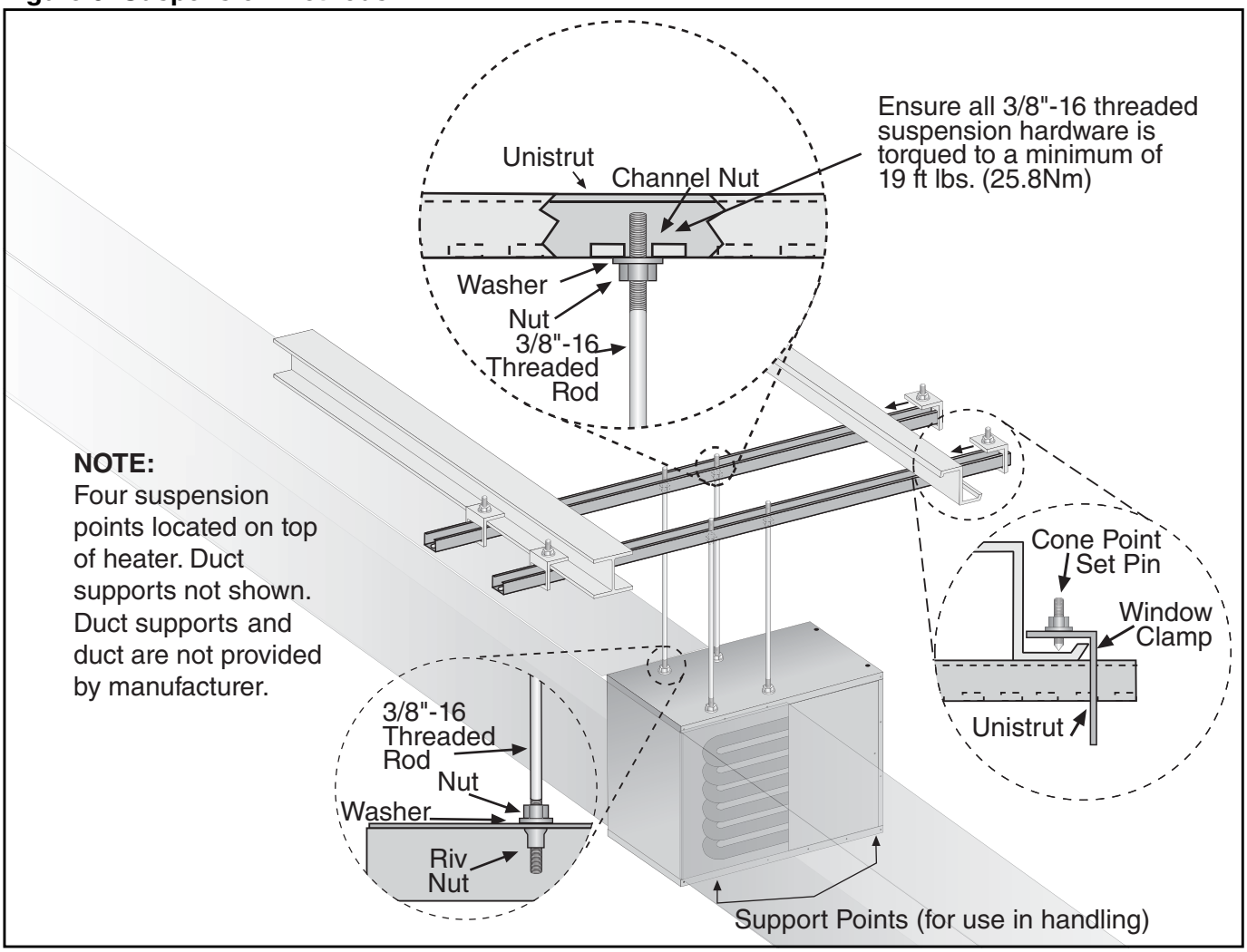
The gas or electrical supply lines must not be used to support the heater.

Do not locate the gas or electrical supply lines directly over the path of the flue products from the heater.

The heater must be installed in a location that is readily accessible for servicing.

The heater must be installed in accordance with clearances to combustibles as indicated on the serial plate, wall tag and throughout the manual. *See Page 7, Section 4*.

Figure 6: Suspension Methods



SECTION 7: VENTING

⚠ WARNING

Carbon Monoxide Hazard

Heaters must be vented outdoors.

Heaters must be installed according to the installation manual.

Failure to follow these instructions can result in death or injury.

7.1 Venting

This heater must be vented in accordance with the rules contained in this manual and with the following national codes and any state, provincial or local codes which may apply: **United States:** Refer to NFPA 54/ANSI Z223.1 - latest revision, National Fuel Gas Code; **Canada:** Refer to CSA B149.1 Natural Gas and Propane Installation Code.
Any portion of vent pipe passing through a combustible wall must have a listed thimble to conform with the above codes.

The bottom of the vent or air intake terminal shall not be located less than 1' (.3 m) above grade level.

The vent shall not terminate less than 7' (2.1 m) above grade where located adjacent to public walkways.

Vent terminal must be installed at a height sufficient to prevent blockage by snow and building materials protected from degradation by flue gasses.

Vent terminal must be beyond any combustible overhang.

Secure all joints with corrosion resistant #8 x 3/8" sheet metal screws.

For single wall venting, pressure sensitive aluminum tape or silicone sealant must be used to seal all joints.

Aluminum tape shall have a minimum temperature rating of 400° F (204° C) and meet SMACNA AFTS-100-73 standards. High temperature silicone sealant must have a minimum temperature rating of 480° F (250° C).

7.1.1 United States Requirements

Vent must terminate at least 3' (.9 m) above any forced air inlet located within 10' (3.1 m).

Vent must terminate at least 4' (1.2 m) below, 4' (1.2 m) horizontally from, or 1' (.3 m) above any door, operable window, or gravity air inlet into any building.

NFPA 54/ANSI Z223.1 - latest revision, National Fuel Gas Code specifies a 4' (1.2 m) horizontal vent terminal clearance from gas and electric meters, regulators and relief equipment.

7.1.2 Canadian Requirements

The vent shall not terminate within 6' (1.8 m) of a mechanical air supply inlet to any building.

The vent shall not terminate within 3' (.9 m) of a window or door that can be opened in any building, any non-mechanical air supply inlet to any building, or of the combustion air inlet of any other piece of equipment.

7.2 Vent Installation

Maintain clearances to combustibles at all times for safety. Clearances are the required distances that combustible objects must be away from the heater to prevent serious fire hazard. *See Page 7, Section 4*. For vented units, the vent must terminate outside of the building.
Vents must be fully sealed and correctly sized for the model. If the vent passes through a wall or ceiling of combustible material, it must be enclosed by a listed thimble and be separated from the thimble by at least a 2" (5 cm) air gap.

For separated combustion models, vents and air intakes must be a fully sealed system and correctly sized for the model. Vent should be assembled as detailed *on Page 13, Figure 7 through Page 16, Figure 12*.

The joints between the vent terminal and the roof or wall must be properly sealed.

Vents and air intakes must be adequately supported so that the heater does not bear the weight of the pipes.

For vent termination *See Page 13, Figure 7 through Page 16, Figure 12*.

7.2.1 Standard Vented Heaters (Models UHD[T][M][X][R] 150 - 400)

The vent must be fitted with a low resistance terminal. *See Page 13, Figure 7 through Page 14, Figure 9*. Standard vented heaters do not allow outdoor air intake for combustion air.

7.2.2 Separated Combustion Heaters (Models UHD[T][M][X]S[R] 150 - 400)

The heaters are designed to be installed as separated combustion heaters. The vent and air intake are run as separate pipes to the wall or roof

terminals. *See Page 15, Figure 10*. As an option, the vent and air intake are run as separate pipes to a concentric vent box and a concentric vent/air intake pipe penetrates the wall or roof. *See Page 15, Figure 11 and Page 16, Figure 12*.

For separated combustion installation, the vent and air intake must be fitted with an individual and correctly sized sealed system and the vent and air intake must terminate at approved wall and roof terminals.

Separated combustion units may not be common vented.

7.3 Horizontal Venting

Horizontally vented heaters must be individually vented, no common venting.

Vent pipe must be sloped ¼" (.6 cm) downward for every 1' (.3 m).

In noncombustible walls only, vent terminal (P/N 02537801-1P) may be used.

For 4'' (10 cm) vents in either combustible or noncombustible walls, use vent terminal (P/N 90502100) or equivalent insulated vent terminal. Follow the manufacturer's instructions for proper installation.

Instead of an insulated vent terminal, a listed thimble with 2" (5 cm) air gap may be used with a 4" (10 cm) vent cap (P/N 90502102).

7.4 Vertical Venting

Vertically vented standard vented heaters can be common vented (up to four heaters).

For 4'' (10 cm) common vent, an approved vent cap (P/N 90502102) must be used.

For 6'' (15 cm) common vent, an approved vent cap (P/N 90502103) must be used.

For common vertical venting of more than two heaters, *See Page 14, Figure 9*.

A vent shall not extend less than 2' (.6 m) above the highest point where it passes through a flat roof of a building.

7.5 Maximum Vent Lengths Table

Model UHD[T][M][X][S][R] 150 - 400	# of Elbows
30 ft (9.1 m)	1
25 ft (7.6 m)	2
20 ft (6.1 m)	3
15 ft (4.5 m)	4
10 ft (3.0 m)	5

7.6 Vent Material

Vent material may be single wall 26 ga. (minimum) galvanized steel or equal thickness stainless steel. Completely seal all joints, refer to *Page 11, Section 7.2*.

If penetrating a combustible wall or roof, a listed thimble with 2" (5 cm) clearance must be used. Where local codes permit, a single section of type B-1 vent material may be used at the roof or wall penetration instead of a thimble. Ensure vent manufacturer's clearance from vent material is maintained. Seal annular space of the type B-1 vent as well as all joints in the remaining vent.

7.7 Replacing an Existing Heater in a Venting System

When replacing an existing heater in a venting system, the venting system may not be properly sized to vent the new heater. The following steps must be followed with each piece of equipment connected to the venting system placed in operation, while any other equipment connected to the venting system are not in operation.

1. Seal any unused openings in the venting system.
2. Inspect the venting system for proper size and horizontal pitch, as required by the NFPA 54/ ANSI Z223.1 - latest revision, National Fuel Gas Code (US) or Standard CSA B149.1 Natural Gas and Propane Installation Code (Canada) and these instructions. Determine that there is no blockage or restriction, leakage, corrosion and other deficiencies which could cause an unsafe condition.
3. Close all building doors and windows and all doors between the space in which the piece(s) of equipment connected to the venting system are located and other spaces of the building. Turn on clothes dryers and any exhaust fans, such as range hoods and bathroom exhausts so that they shall operate at maximum speed. Do not operate a summer exhaust fan. Close fireplace dampers.
4. Follow the lighting instructions. Place the equipment being inspected in operation. Adjust thermostat so that the equipment will operate continuously.
5. For any equipment having a draft hood, test for draft hood equipment spillage at the draft hood relief opening after five minutes of main burner operation. Use the flame of a match or candle.

6. After it has been determined that each piece(s) of equipment connected to the venting system properly vents when tested as outlined above, return doors, windows, exhaust fans, fireplace dampers and any other gas-burning piece(s) of equipment to their previous conditions of use.
7. If improper venting is observed during any of the above tests, the venting system must be corrected by a contractor qualified in the installation and service of gas-fired equipment or your local gas supplier. If the venting must be resized, use appropriate tables in (US) Appendix G of NFPA 54/ANSI Z223.1 - latest revision, National Fuel Gas Code (US) or Standard CSA B149.1 Natural Gas and Propane Installation Code (Canada) to determine minimum size. All vent corrections must be in accordance with the appropriate local codes and the NFPA 54/ANSI Z223.1 - latest revision, National Fuel Gas Code (US) or Standard CSA B149.1 Natural Gas and Propane Installation Code (Canada).

Figure 7: Vent and Roof Detail

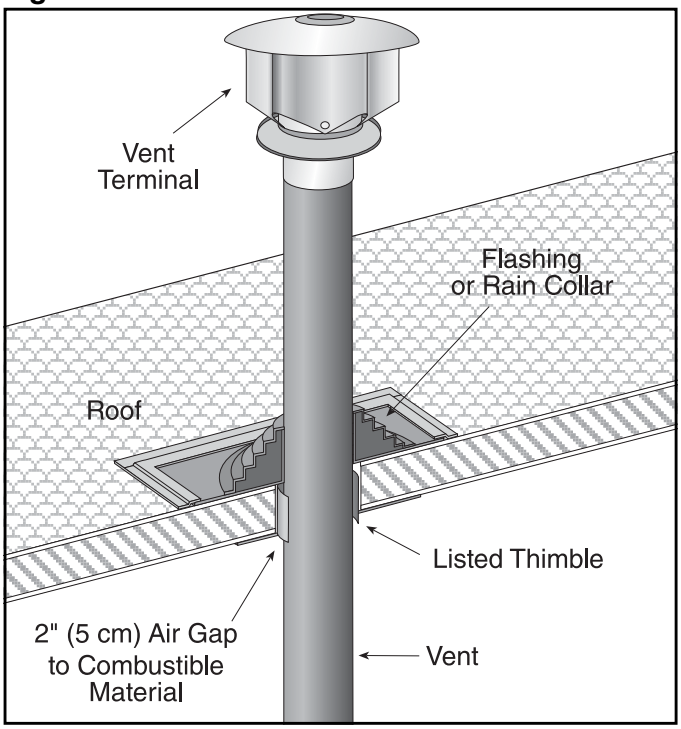
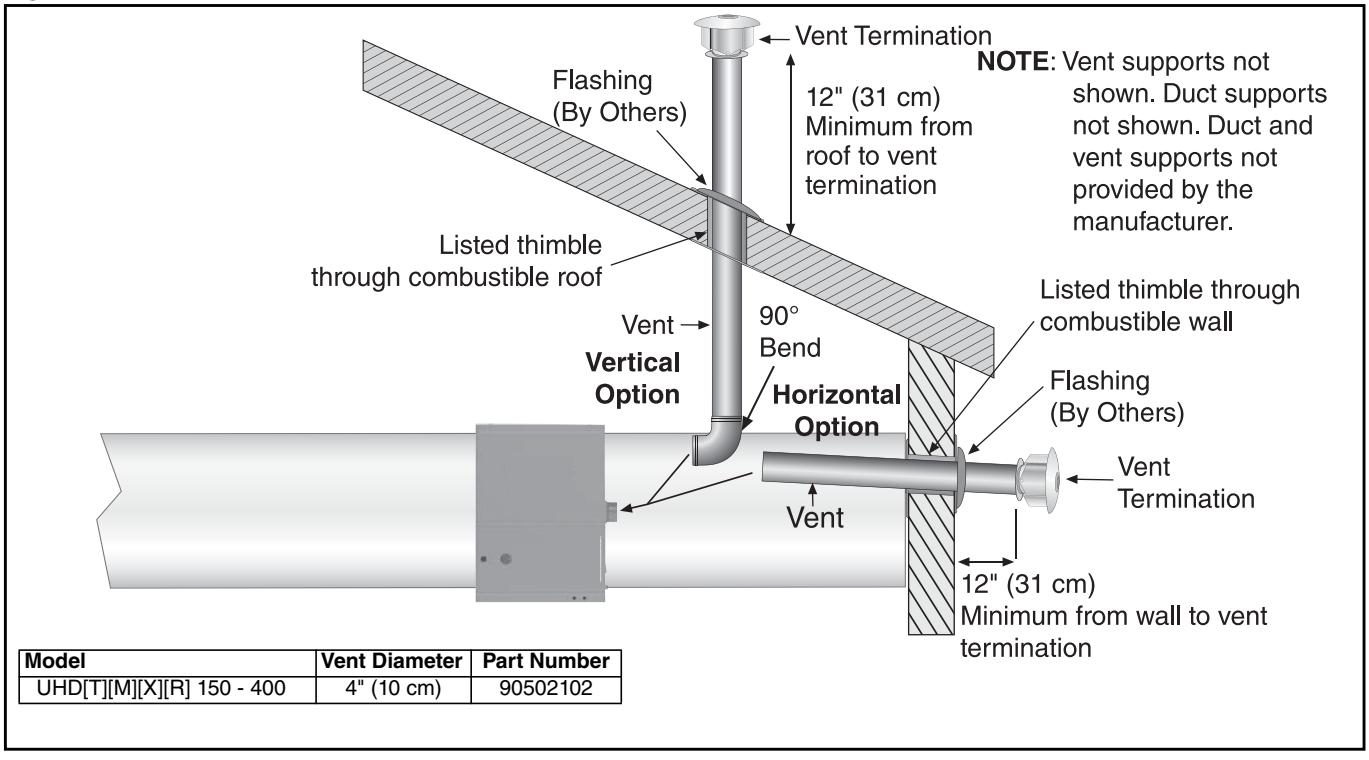
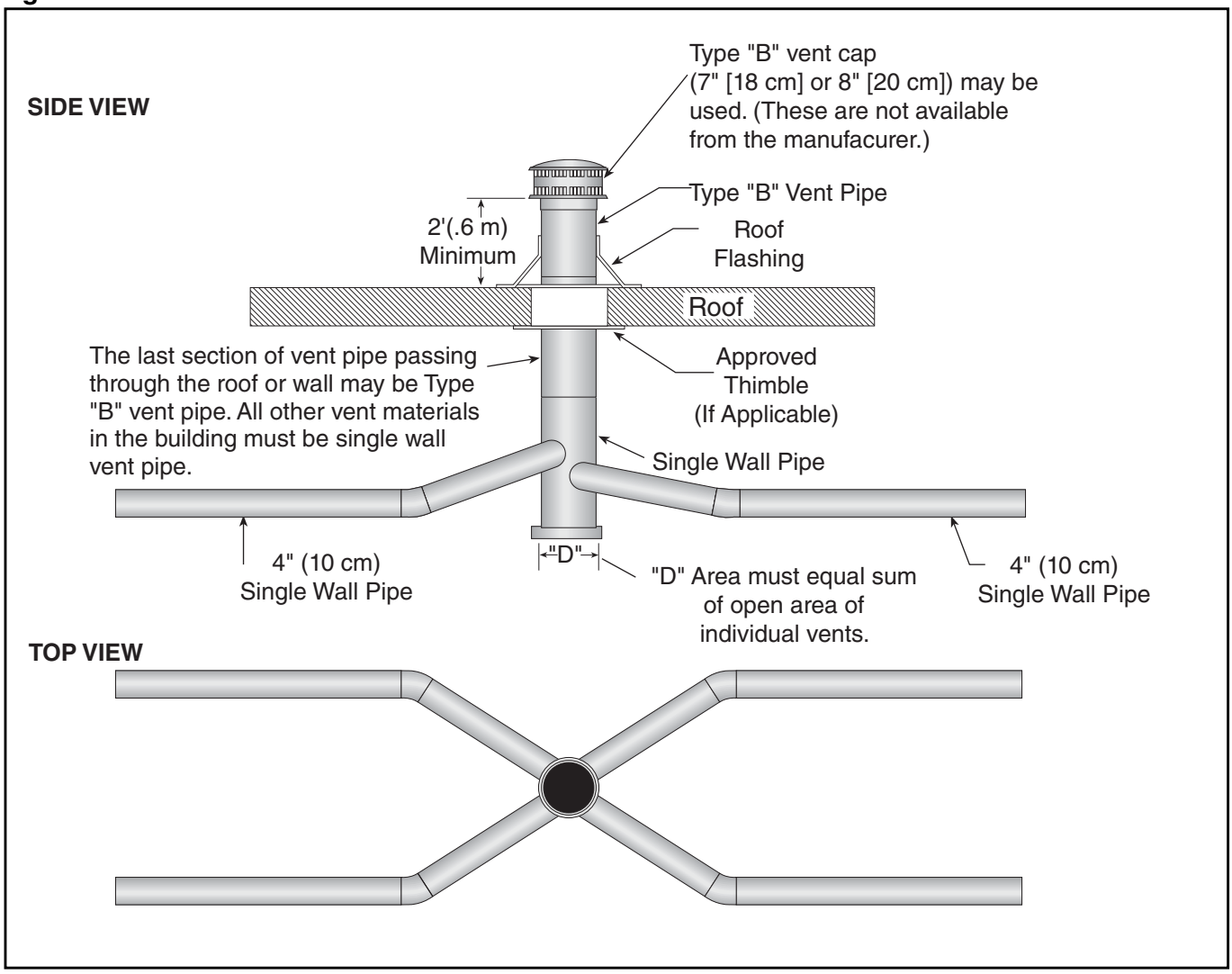


Figure 8: Standard Vented Heater - Vertical and Horizontal Vent Termination



Model	Vent Diameter	Part Number
UHD[T][M][X][R] 150 - 400	4" (10 cm)	90502102

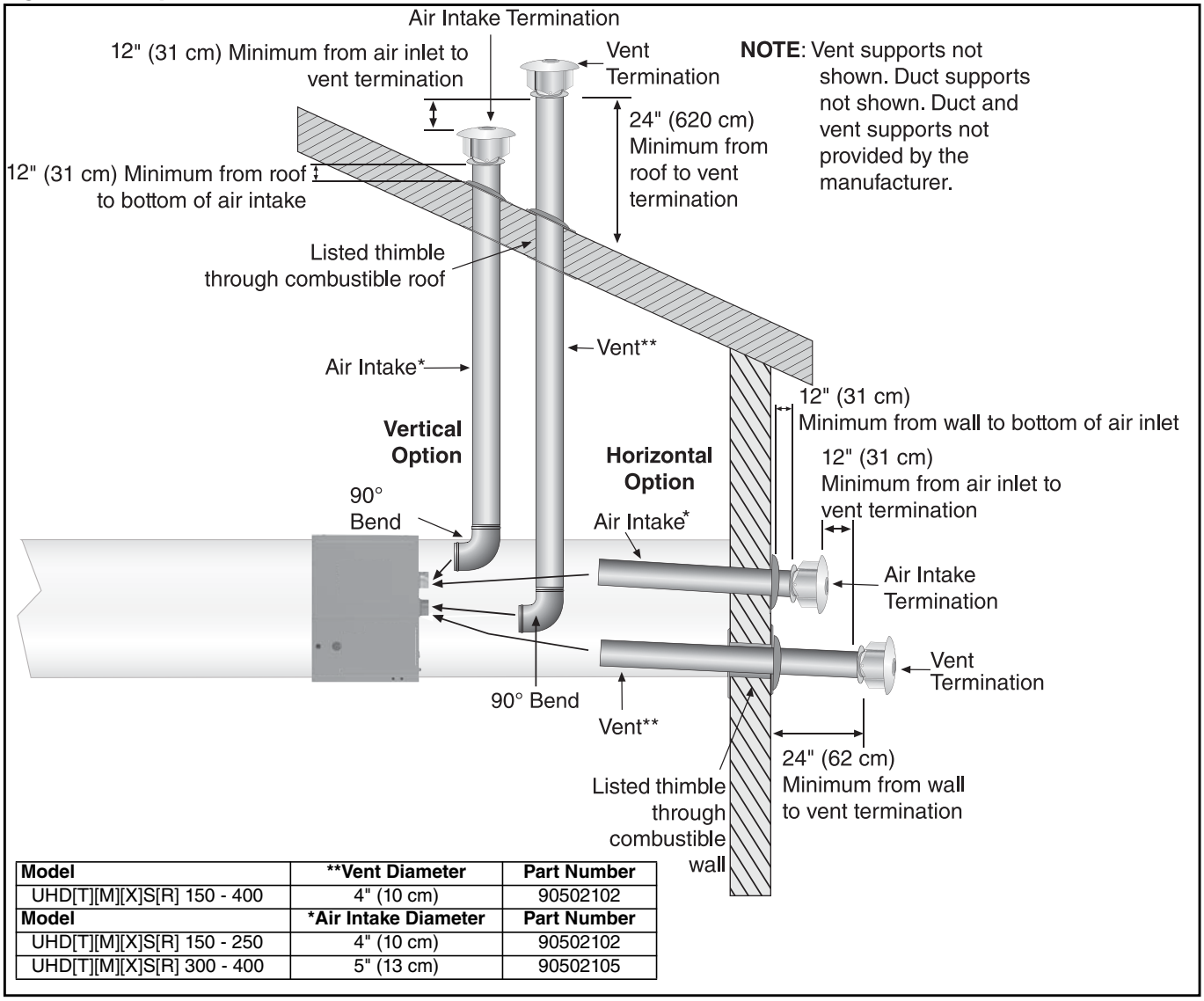
Figure 9: Standard Vented Heater - Common Vertical Vent Termination



Requirements:

- Maximum of four heaters can be commonly vented through the roof.
- Heaters must be of the same BTU output.
- Heaters must be controlled by a common thermostat.
- Connections to a common stack must be positioned to avoid direct opposition between streams of combustion gases.

Figure 10: Separated Combustion Heater - Vertical and Horizontal Vent Termination



Model	**Vent Diameter	Part Number
UHD[T][M][X]S[R] 150 - 400	4" (10 cm)	90502102
Model	***Air Intake Diameter**	**Part Number**
UHD[T][M][X]S[R] 150 - 250	4" (10 cm)	90502102
UHD[T][M][X]S[R] 300 - 400	5" (13 cm)	90502105

Figure 11: Concentric Vent Box

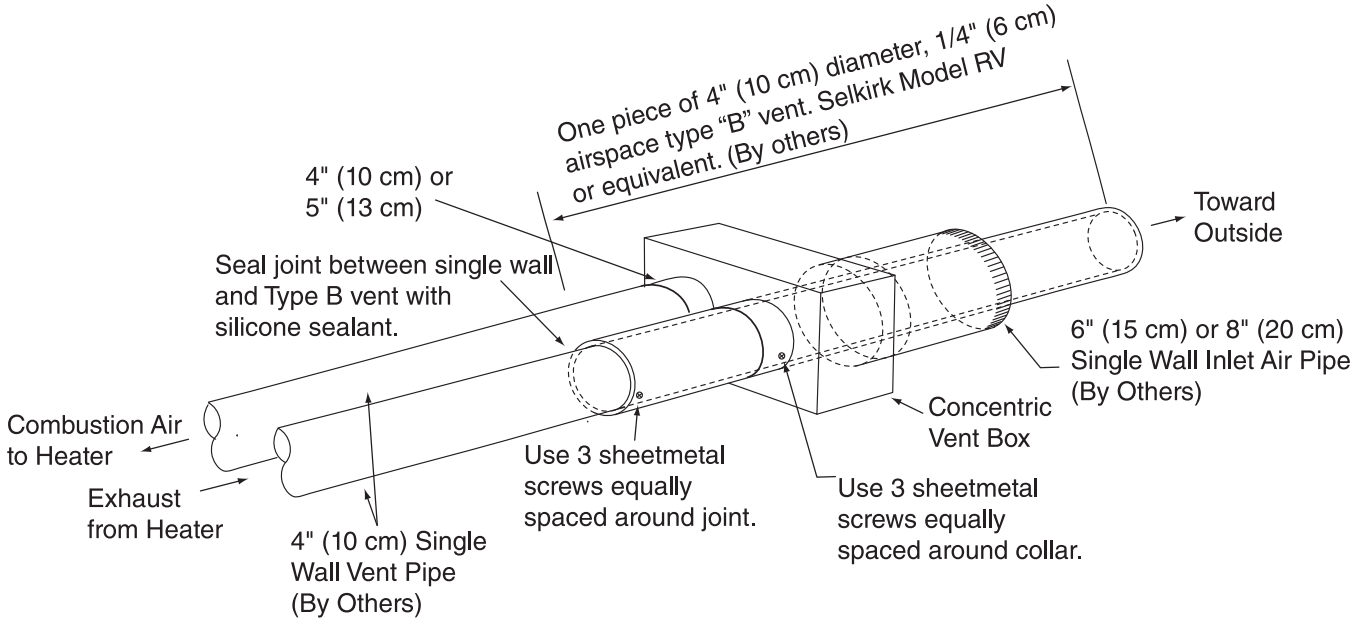
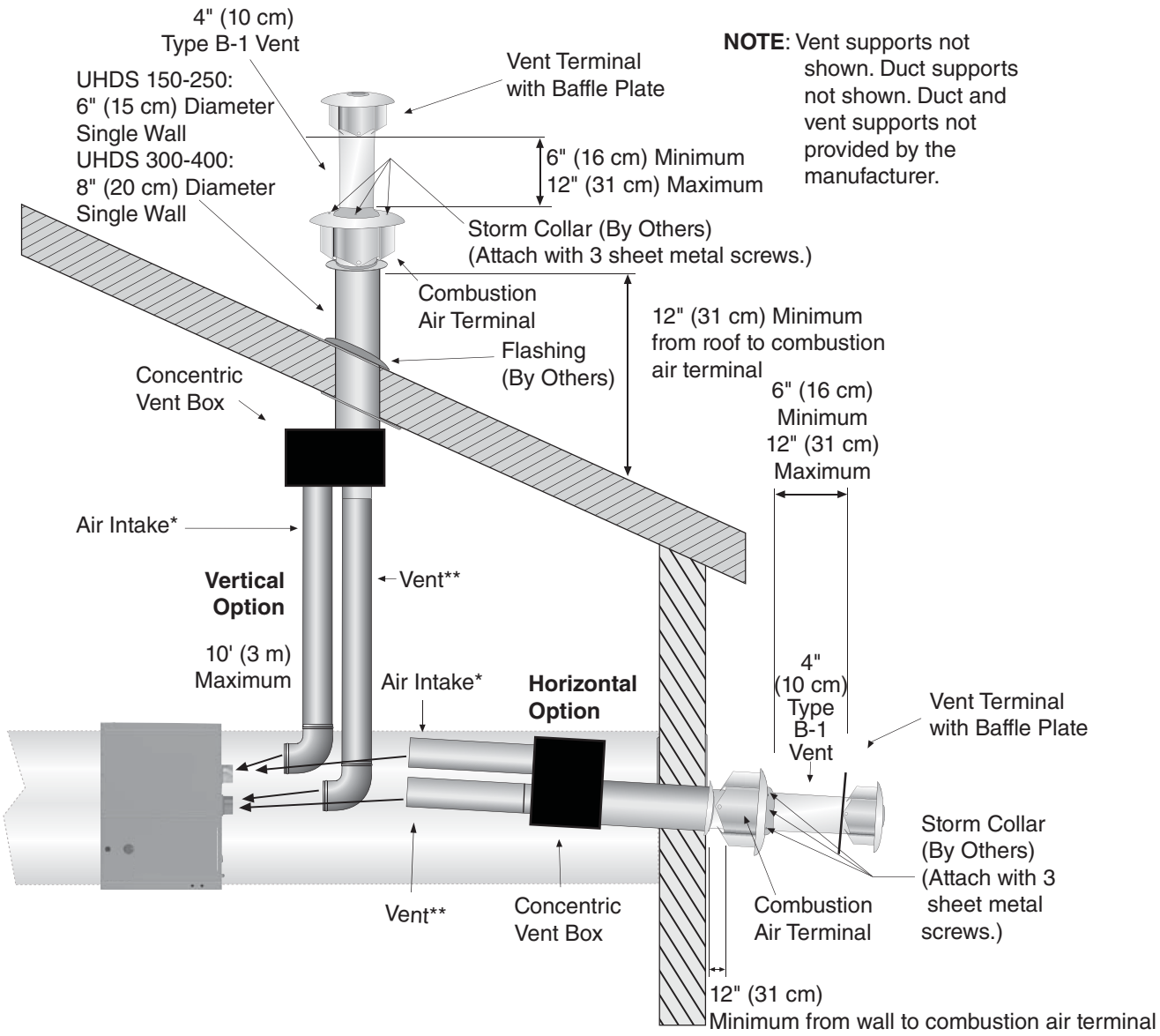


Figure 12: Concentric Vertical and Horizontal Vent Termination - Separated Combustion Heater



NOTE: Vent supports not shown. Duct supports not shown. Duct and vent supports not provided by the manufacturer.

Description	Part Number	Qty.
Concentric Vent Kit (150 - 250)	**UHVK1**	
Concentric Vent Box Top & Side Assembly	90504113	1
Concentric Vent Box Bottom Assembly	90504112	1
Screw #6 x 3/8 Self Drilling	91119100	14
4" (10 cm) Vent Terminal with Baffle Plate	90502102R	1
6" (15 cm) Combustion Air Terminal	90502103	1

Description	Part Number	Qty.
Concentric Vent Kit (300 - 400)	**UHVK2**	
Concentric Vent Box Top & Side Assembly	90504013	1
Concentric Vent Box Bottom Assembly	90504012	1
Screw #6 x 3/8 Self Drilling	91119100	14
4" (10 cm) Vent Terminal with Baffle Plate	90502102R	1
8" (20 cm) Combustion Air Terminal	90502104	1

Model	**Vent Diameter
UHD[T][M][X]S[R] 150 - 250	4" (10 cm)
Model	***Air Intake Diameter**
UHD[T][M][X]S[R] 150 - 250	4" (10 cm)
UHD[T][M][X]S[R] 300 - 400	5" (13 cm)

SECTION 8: AIR SUPPLY

⚠ WARNING

Explosion Hazard

Equipment must have access to uncontaminated air at all times.

Failure to follow these instructions can result in death, injury or property damage.

8.1 Separated Combustion Installation

When installed as a separated combustion heater (UHD[T][M][X]S[R]), the air for combustion is drawn in from outside the building.

8.2 Building Ventilation

Where ventilation is required, air must be taken from an outside point where it is not likely to be contaminated or obstructed.

8.3 Outside Combustion Air Supply

If outside combustion air supply is required, separated combustion model (UHD[T][M][X]S[R]) heaters must be used.

Caution: If the building has a slight negative pressure or corrosive contaminants such as halogenated hydrocarbons are present in the air, an outside combustion air supply to the heater is required. Seal all combustion air pipe joints. The outside air terminal must not be more than 1' (31 cm) above the vent terminal.

8.3.1 Length Requirements

Follow the constraints listed *on Page 12, Section 7.5*.

SECTION 9: GAS PIPING

⚠ WARNING

Fire Hazard

Connect gas supply according to Figure 13.

Do not use gas supply pipe and electrical connections to support heater's weight.

Gas can leak if not installed properly.

Failure to follow these instructions can result in death, injury or property damage.

⚠WARNING

Explosion Hazard

Leak test all components of gas piping before operation.

Gas can leak if piping is not installed properly.

Do not high pressure test gas piping with heater connected.

Failure to follow these instructions can result in death, injury or property damage.

A gas meter is connected to the service pipe by the gas supply company. An existing meter should be checked, preferably by the company, to ensure that the meter is adequate for the rate of gas supply required.

Installation pipes must be fitted in accordance with local and national codes. Pipes of smaller size than the heater inlet gas connection should not be used.

Gas lines must meet applicable codes:

United States: Flexible stainless steel gas hose (US models) is certified per the standard for connectors for gas equipment. ANSI Z21.21/CSA 6.10 – latest revision.

Canada: Rubber type 1 gas hose (Canadian models) is certified as being in compliance with the standard for elastomeric composite hose and hose couplings for conducting propane and natural gas, CAN/CGA 8.1 – latest revision.

9.1 Connections

Connect the heater to the gas supply ensuring that the final connections are as follows:

- Gas supply pipe work is run in medium or heavy gauge tubing in compliance with local and national codes.
- Meter and service must be large enough to handle all the burners being installed plus any other connected load. The gas pipe which feeds the system must be large enough to supply the required gas with a maximum pressure drop of 1/2 in wc. When gas piping is not included in the layout drawing, contact the local gas supplier.
- An isolating valve and union connection should be used and fitted into the supply adjacent to the heater.
- A minimum 1/8" NPT plugged tapping accessible for test connection must be installed immediately upstream of the gas supply connection to the heater.
- For suspended heaters, an approved metal flexible connection between the isolating valve and the heater may be used. **To reduce pressure loss, use one pipe size larger than the heater gas connection.**

IMPORTANT - The complete installation must be purged and tested for gas soundness in accordance with local and national codes.

Caution: Do not high pressure (in excess of 1/2 psi [14 in wc]) test the gas piping with the burner connected. Close manual shut-off valve during any pressure testing equal to or less than 1/2 psi (14 in wc).

Check the pipe and tubing ends for leaks before placing heating equipment into service. When checking for gas leaks, use a soap and water solution; never use an open flame.

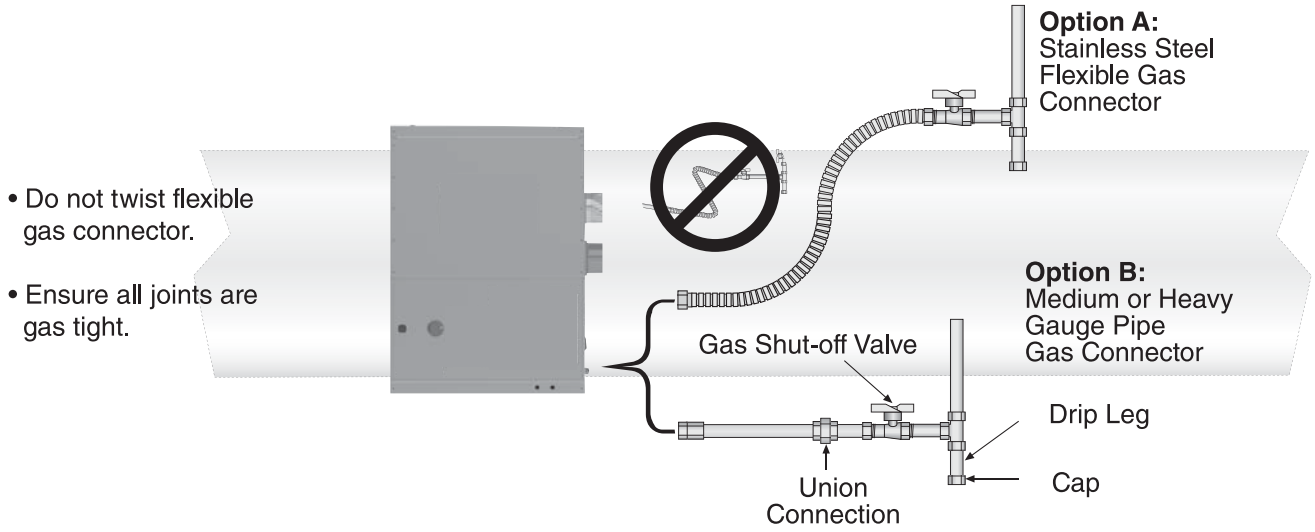
Figure 13: Gas Connection

⚠ CAUTION

Product Damage Hazard

Hold gas nipple securely with pipe wrench when attaching flexible gas connector.

Failure to follow these instructions can result in product damage.



SECTION 10: WIRING

⚠ DANGER

Electrical Shock Hazard

Disconnect electric before service.

More than one disconnect switch may be required to disconnect electric from heater.

Heater must be properly grounded.

Failure to follow these instructions can result in death or electrical shock.

All heater models require constant 120 V/1Ø/60 Hz power supply. Check heater serial plate for electrical rating for proper circuit sizing. For servicing, a disconnect switch of proper electrical rating should be installed in the vicinity of the heater.

All heaters are equipped with thermostat connections suitable to power a 24 V thermostat.

Heater must be wired and electrically grounded in accordance with local codes. In the absence of local codes in accordance with: United States: refer to National Electrical Code® NFPA 70 - latest revision Canada: refer to Canadian Electrical Code CSA C22.1 Part I - latest revision.

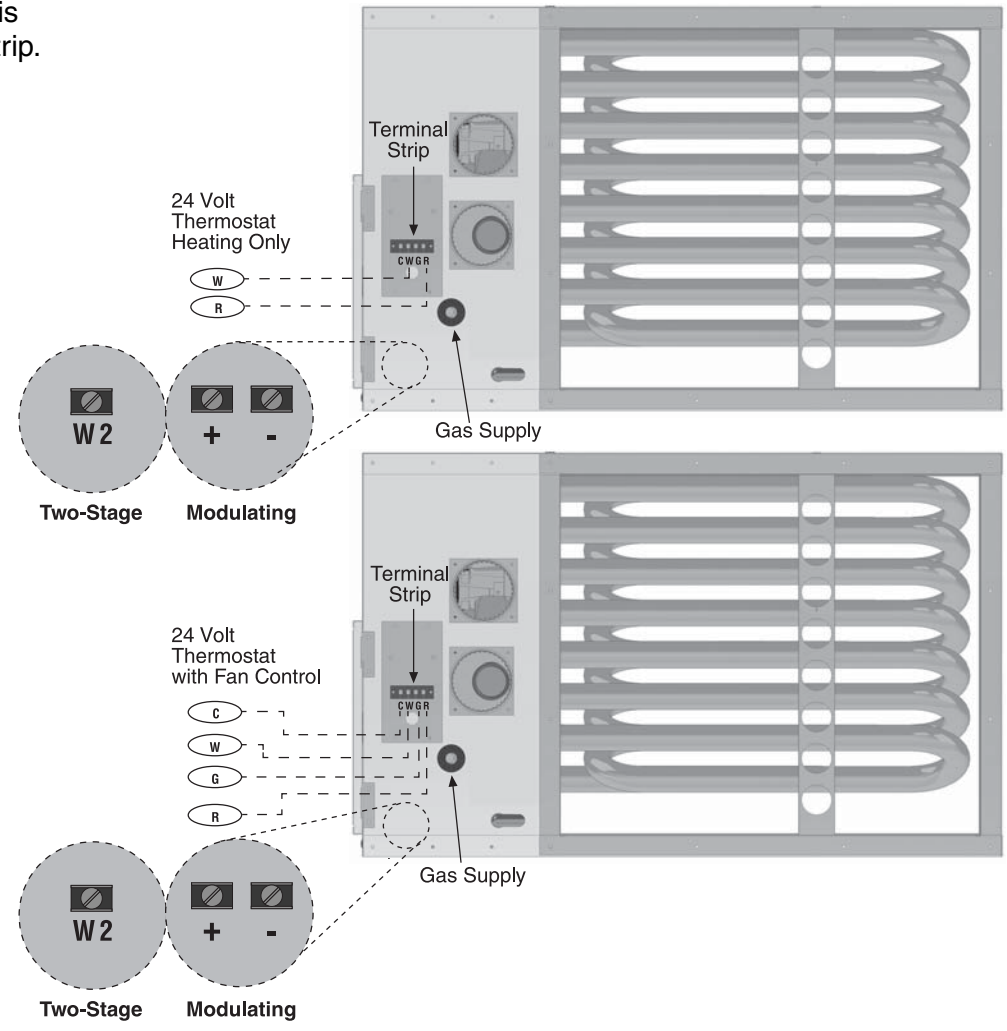
10.1 Positioning Thermostats

A room thermostat should be mounted on a vibration-free wall or column at a height of approximately 5' (1.5 m) from the floor to measure the ambient temperature. It should be clear of both cold drafts and the direct path of warm air from the heater.

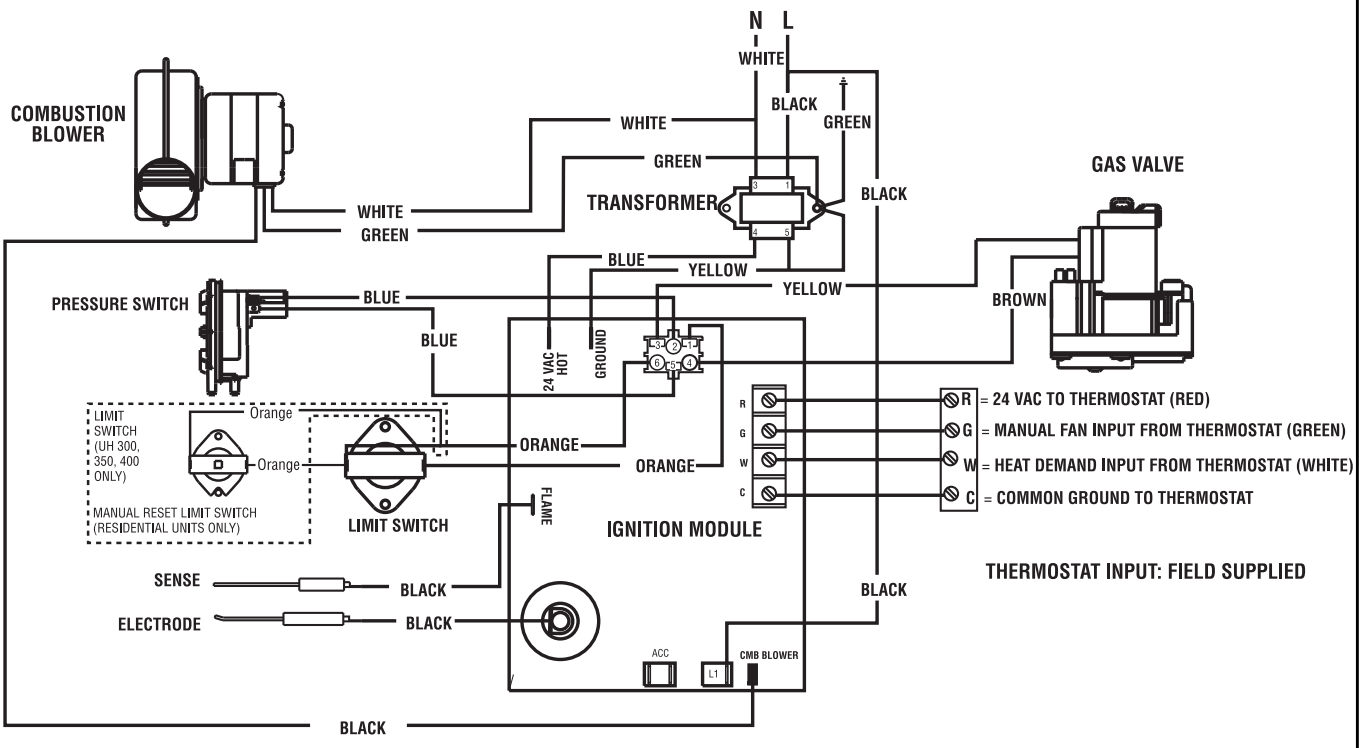
Avoid mounting thermostat on outside walls or in areas directly exposed to radiant heat or sunlight. Install wall tag in a visible location near thermostat. *See Page 5, Section 2.1* for wall tag details.

10.2 Low Voltage Thermostat for Models UHD[T][M][X][S][R] 150-400

NOTE: Electrical supply is located below terminal strip.

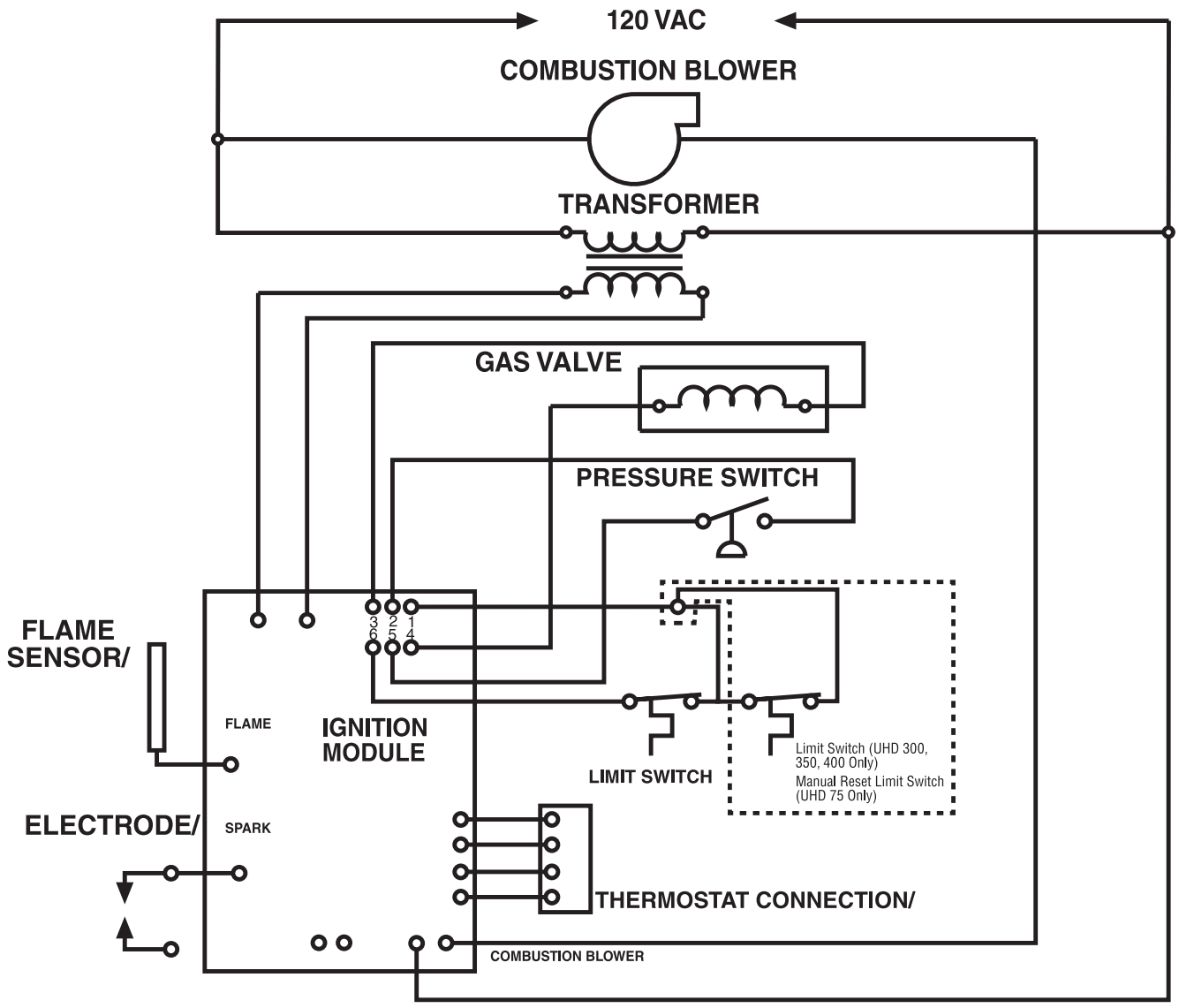


10.3 UHD[X][S][R] Series Internal Wiring Diagram for Single Stage Gas Valves



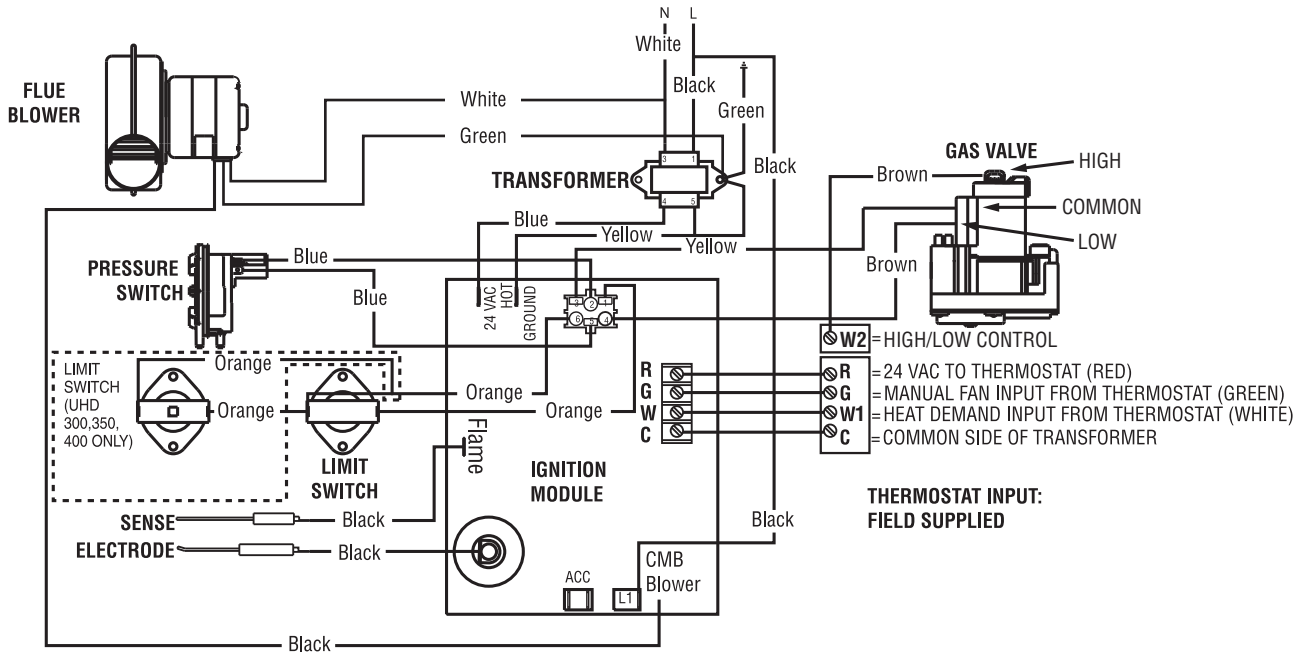
IMPORTANT:
For field wiring into service junction box, or if any of the original wire supplied with the heater must be replaced, it must be replaced with wiring material having a temperature rating of at least 221° F (105° C) and 600 V. For supply connections, use No. 14 AWG or larger wires.

10.4 UHD[X][S][R] Series Ladder Wiring Diagram for Single Stage Gas Valves



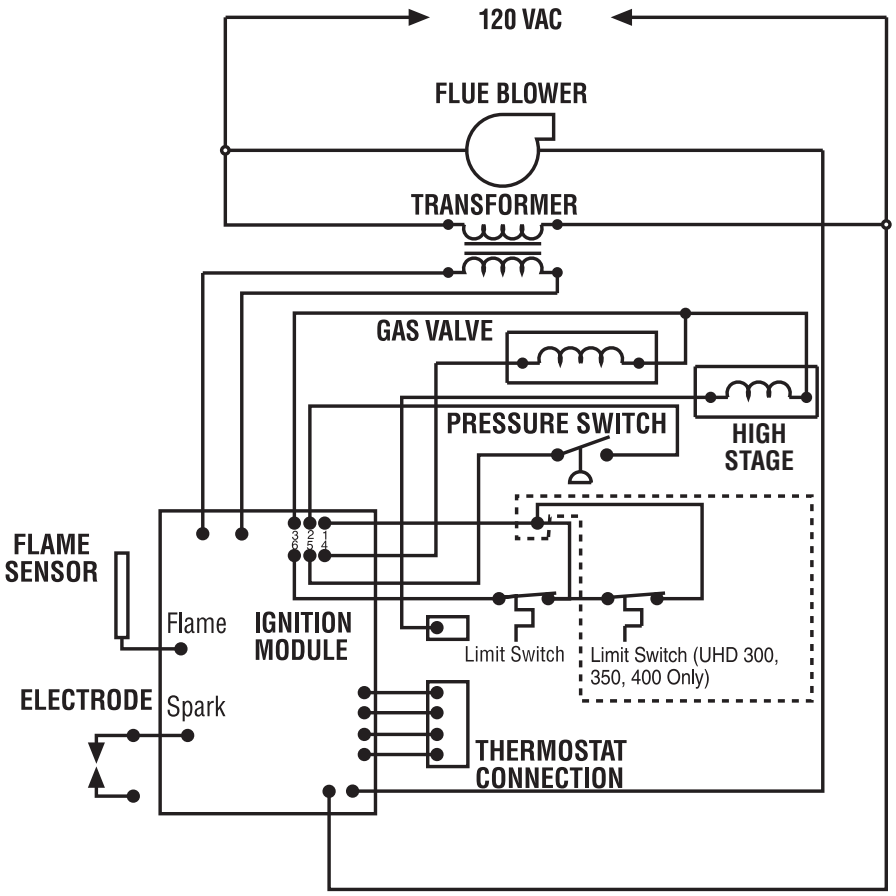
IMPORTANT:
For field wiring into service junction box, or if any of the original wire supplied with the heater must be replaced, it must be replaced with wiring material having a temperature rating of at least 221° F (105° C) and 600 V. For supply connections, use No. 14 AWG or larger wires.

10.5 UHD[T][X][S][R] Series Internal Wiring Diagram for Two Stage Gas Valves



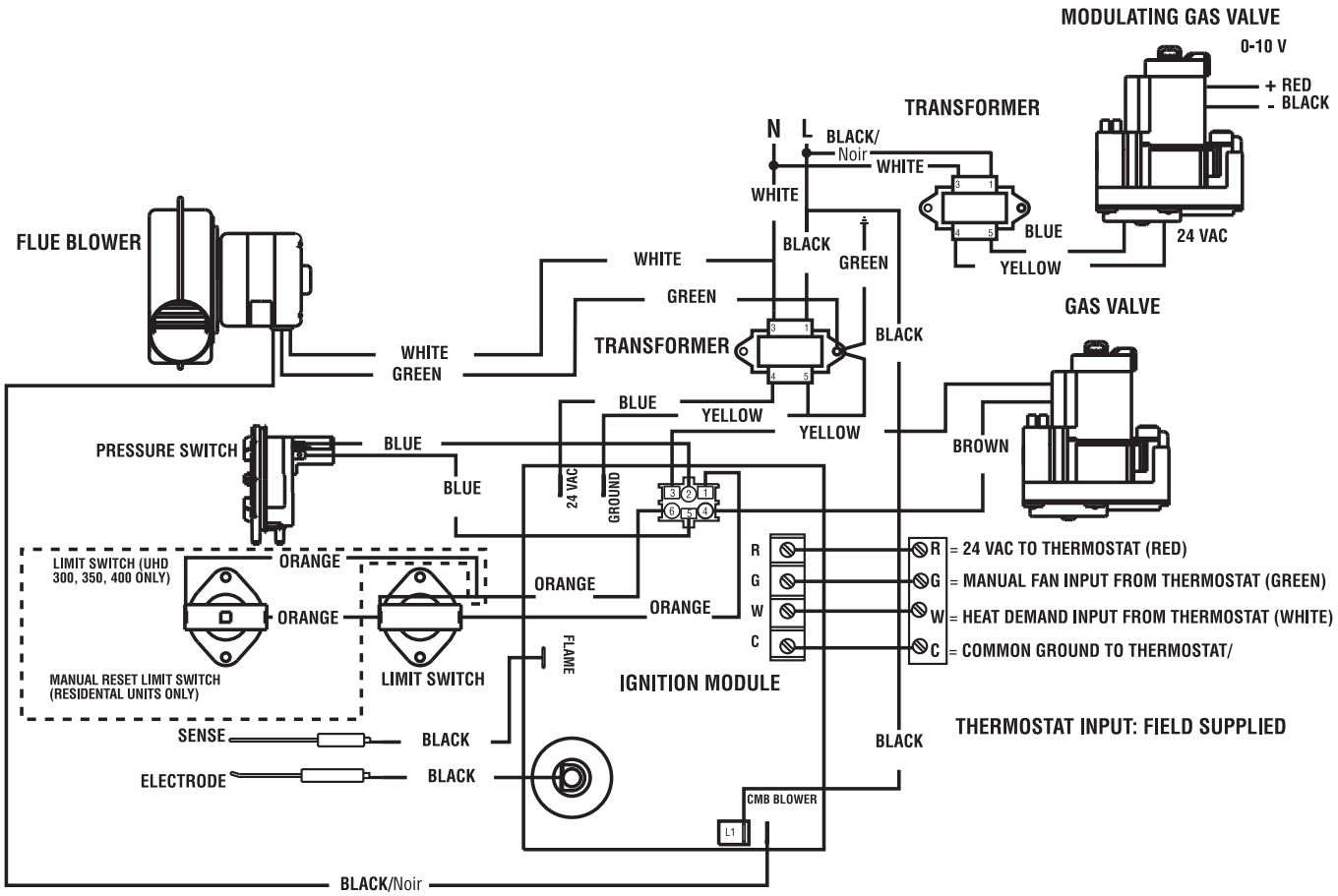
IMPORTANT:
For field wiring into service junction box, or if any of the original wire supplied with the heater must be replaced, it must be replaced with wiring material having a temperature rating of at least 221° F (105° C) and 600 V. For supply connections, use No. 14 AWG or larger wires.

10.6 UHD[T][X][S][R] Series Ladder Wiring Diagram for Two Stage Gas Valves



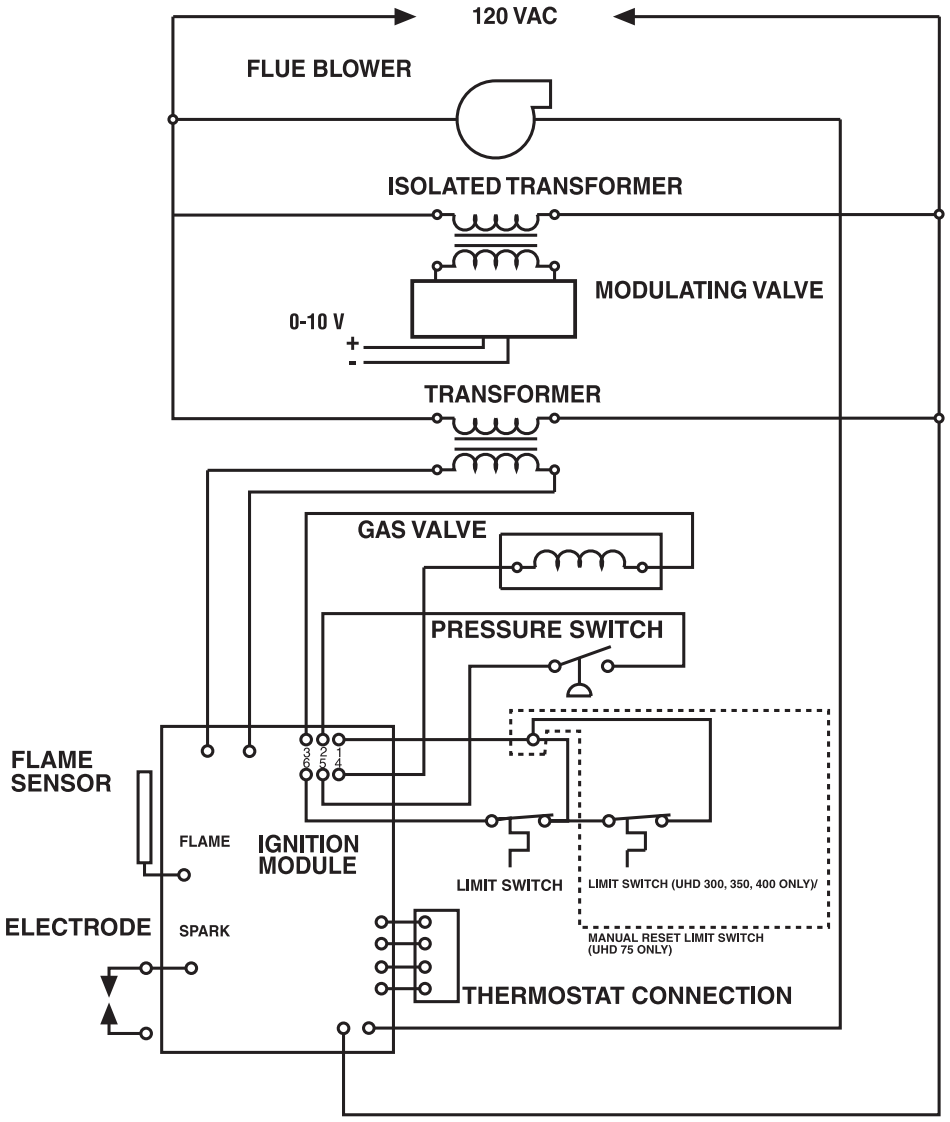
NOTE:
For field wiring into service junction box, or if any of the original wire supplied with the heater must be replaced, it must be replaced with wiring material having a temperature rating of at least 105° C (221° F) and 600 volts. For supply connections use No. 14 AWG or larger wires.

10.7 UHD[M][X][S][R] Series Internal Wiring Diagram for Modulating Gas Valves



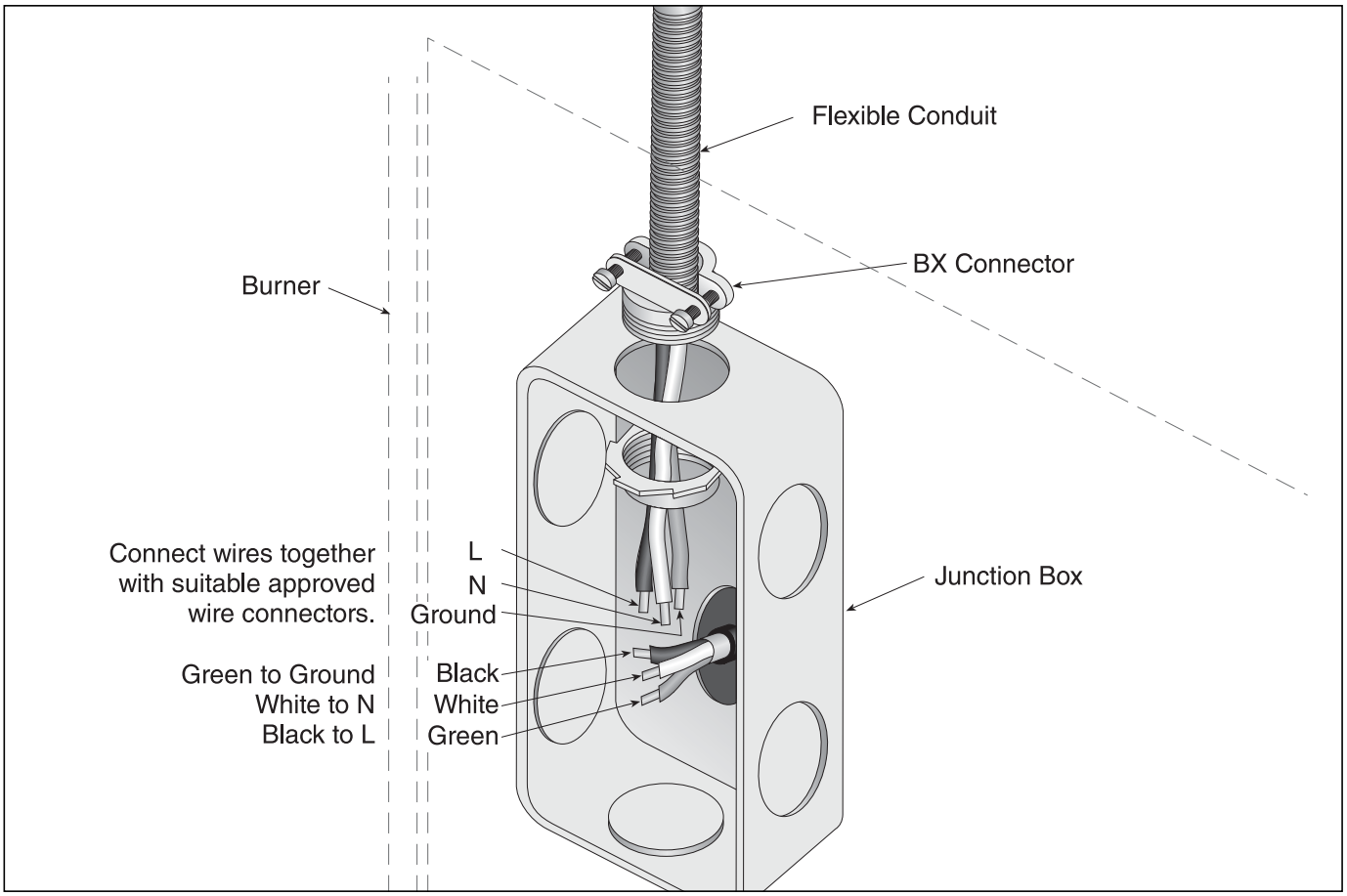
IMPORTANT:
For field wiring into service junction box, or if any of the original wire supplied with the heater must be replaced, it must be replaced with wiring material having a temperature rating of at least 221° F (105° C) and 600 V. For supply connections, use No. 14 AWG or larger wires.

10.8 UHD[M][X][S][R] Series Ladder Wiring Diagram for Modulating Gas Valves



IMPORTANT:
For field wiring into service junction box, or if any of the original wire supplied with the heater must be replaced, it must be replaced with wiring material having a temperature rating of at least 221° F (105° C) and 600 V. For supply connections, use No. 14 AWG or larger wires.

10.9 Electrical Connection to the Heater



IMPORTANT: Junction box is not provided with heater.
Conduit can also be attached directly to heater with wire junction made within the heater cabinet.

SECTION 11: OPERATION AND MAINTENANCE

⚠ DANGER	⚠ WARNING		
Electrical Shock Hazard **Disconnect electric before service.** **Heater must be connected to a properly grounded electrical source.**	**Explosion Hazard** **Turn off gas supply to heater before service.**	**Burn Hazard** **Allow heater to cool before service.** **Tubing may still be hot after operation.**	**Cut/Pinch Hazard** **Wear protective gear during installation, operation and service.** **Edges are sharp.**
Failure to follow these instructions can result in death, electric shock, injury or property damage.			

Read this manual carefully before installation, operation, or service of this equipment. All components are accessed via the hinged door. Opening the door exposes live electrical connections and hot components.

Prior to any maintenance or service of the heater, shut off, lockout and tagout the electrical disconnect and gas valve that supplies the unit in accordance with OSHA regulations.

11.1 Pre-Start-Up Checks

All pre-start-up checks must be carried out before lighting the heater.

Ensure that the heater and all controls are suitable for the gas, pressure and electrical supply to which they are to be connected.

11.1.1 Electrical Checks

1. Check that all site wiring is connected in accordance with the appropriate wiring diagram *on Page 21, Section 10.3, Page 23, Section 10.5*, *or Page 25, Section 10.7*.

11.1.2 Gas Supply

All aspects of the gas installation including the gas meter must be inspected, tested for gas tightness and purged in accordance with local and national codes.

Ensure that the air is fully purged from the heater inlet pipe up to the main gas valve inlet test nipple.

11.1.3 Mechanical Checks

1. Check that the flue (and air intake for separated combustion units) is installed in accordance with the instructions in this manual and local regulations. *See Page 11, Section 7*.

11.2 Begin Start-Up

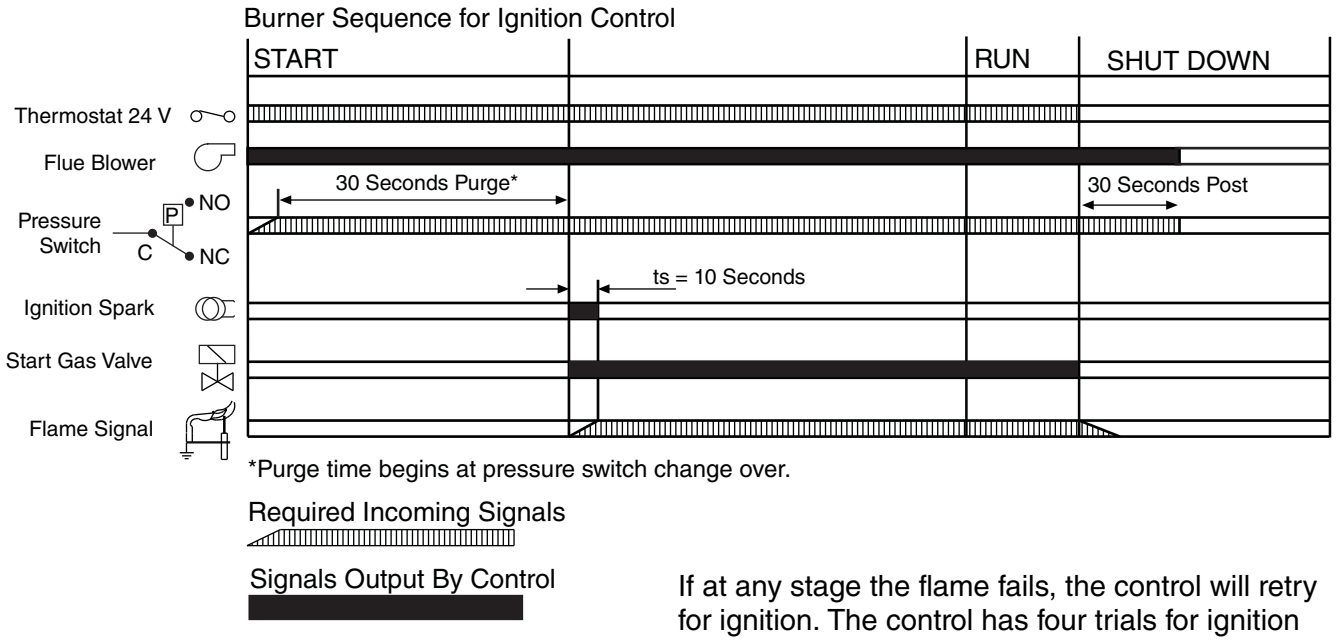
11.2.1 Before Operating the Heater

To ensure that all the controls are in safe working order, operate the heater for the first time with the isolating gas valve turned off and power supply turned on.

1. Turn off the isolating gas valve.
2. Turn up the thermostat above room temperature. The automatic ignition sequence will now begin as described *on Page 29, Figure 14*.

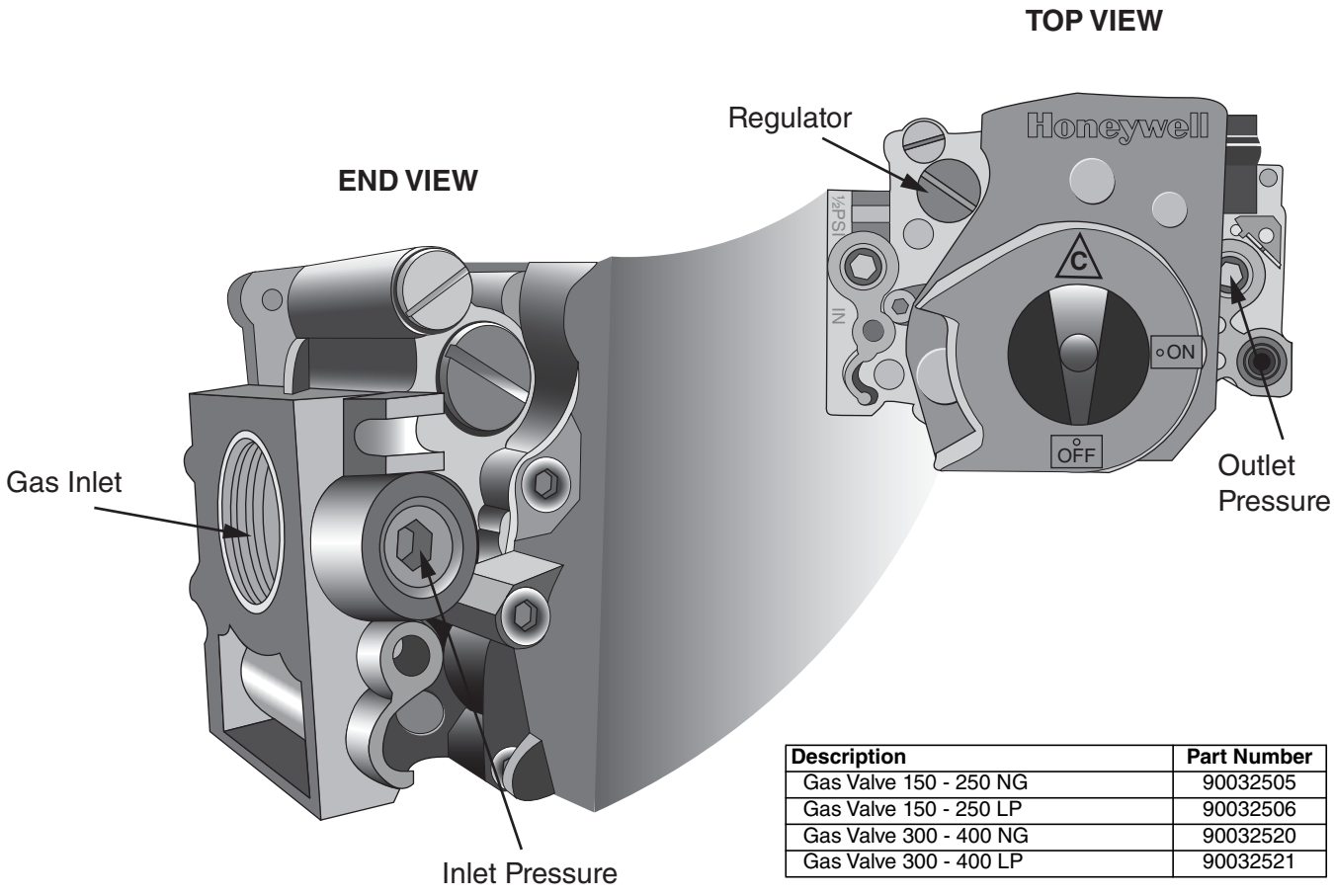
There will be no ignition of the burner and lockout will occur, which proves the controls are operating correctly.

Figure 14: Automatic Burner Control Sequence



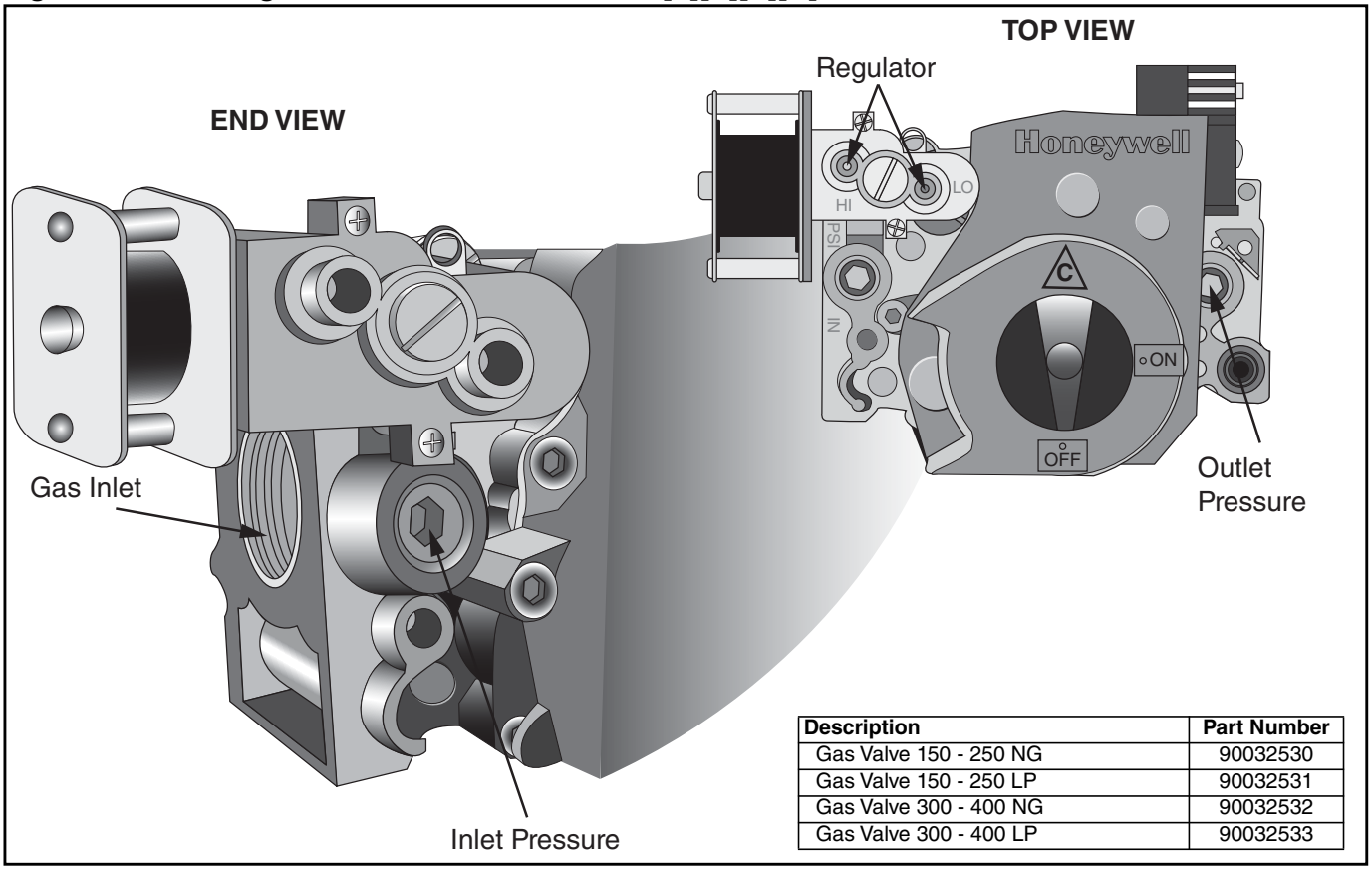
If at any stage the flame fails, the control will retry for ignition. The control has four trials for ignition before a one hour lockout.

Figure 15: Single Stage Gas Valve for Models UHD[X][S][R] 150 – 400



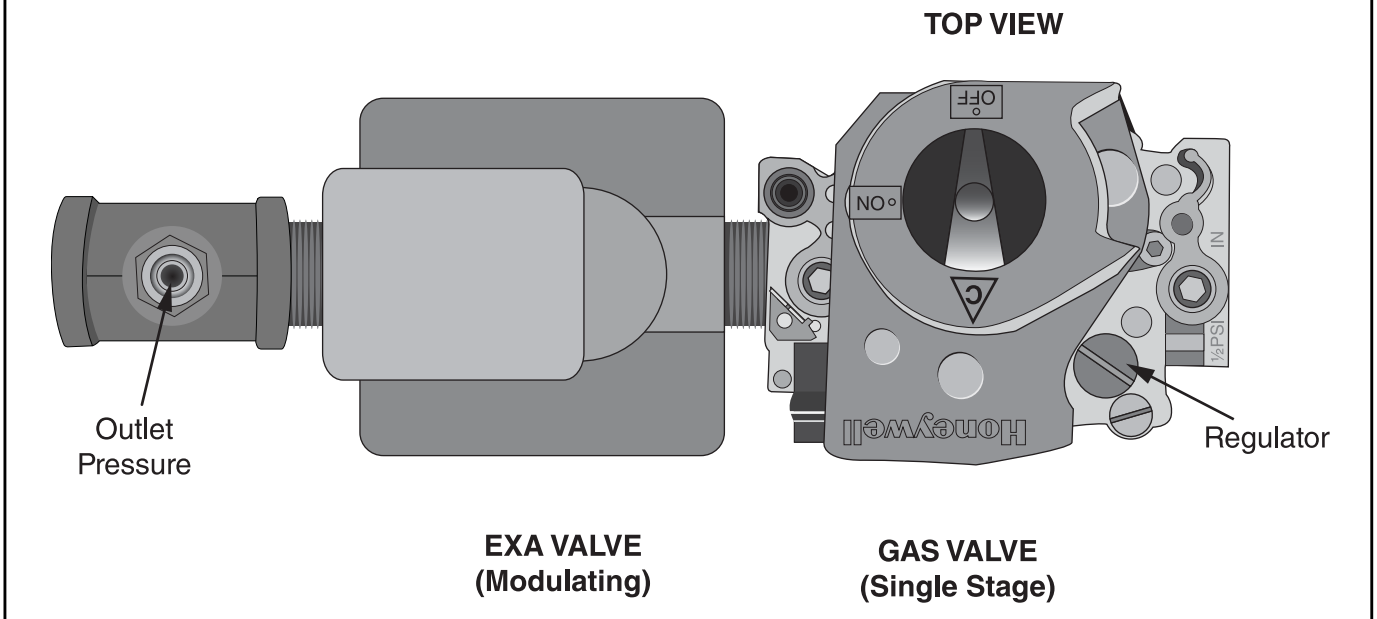
Description	Part Number
Gas Valve 150 - 250 NG	90032505
Gas Valve 150 - 250 LP	90032506
Gas Valve 300 - 400 NG	90032520
Gas Valve 300 - 400 LP	90032521

Figure 16: Two Stage Gas Valve for Models UHD[T][X][S][R] 150 - 400



Description	Part Number
Gas Valve 150 - 250 NG	90032530
Gas Valve 150 - 250 LP	90032531
Gas Valve 300 - 400 NG	90032532
Gas Valve 300 - 400 LP	90032533

Figure 17: Modulating Gas Valve for Models UHD[M][X][S][R] 150 - 400



Description	Part Number
Gas Valve 150 - 250 NG	90032505
Gas Valve 150 - 250 LP	90032506
Gas Valve 300 - 400 NG	90032520
Gas Valve 300 - 400 LP	90032521
1/2" Exa Valve 150-250	90032550
3/4" Exa Valve 300-400	90032551

11.2.2 Start-Up the Gas Valve (All Gases)

11.2.2.1 Check Burner Gas Pressure (Single Stage)

1. Remove the plug in the outlet (burner) pressure test point and connect a pressure tap and a manometer. *See Page 29, Figure 15*.
2. With the burner firing, measure the pressure on the manometer. To adjust the burner pressure, remove the regulator cover from the valve and turn the regulator adjustment screw to set the required burner pressure as stated in the Technical Data Table for the correct gas and model *on Page 51, Section 16.3 and Page 53, Section 16.6*.

11.2.2.2 Check Burner Gas Pressure (Two Stage)

1. Remove the plug in the gas valve outlet pressure test point and connect a pressure tap and a manometer. *See Page 30, Figure 16*.
2. With the unit operating in high fire or low fire, measure the outlet pressure on the manometer. Measure burner pressure in both operating modes. To adjust the burner pressure, remove plastic cover from regulators and adjust High and/or Low regulators as needed. Required burner pressures are indicated in the Technical Data Table for the correct gas and model *on Page 51, Section 16.3 and Page 53, Section 16.6*
3. To set the high fire rate, adjust the high fire adjustment on the gas valve. To set the low fire rate (with the unit running in low fire), adjust the low fire adjustment on the gas valve.

11.2.2.3 Check Burner Gas Pressure (Modulating)

1. Loosen screw in outlet pressure tap shown on Page 30, Figure 17 and connect manometer. Gas pressure is NOT measured at Honeywell single stage gas valve.
2. With burner firing, measure pressure on manometer. To measure high fire burner pressure, disconnect modulating thermostat signal and apply 10 VDC to modulating input connections (polarity sensitive). To adjust high fire burner pressure, remove regulator cover from Honeywell single stage gas valve and turn regulator adjustment screw to set required burner pressure as stated in the Technical Data Table for the correct gas and model *on Page 51, Section 16.3 and Page 53, Section 16.6*
3. To measure low fire burner pressure disconnect 10 VDC signal to modulating valve.

NOTE: Low fire burner pressure is set at factory and not field adjustable. (modulating)

NOTE: If the correct burner pressure cannot be reached, then check the inlet pressure to the valve with the burner firing. See Technical Data Table *on Page 51, Section 16.3 and Page 53, Section 16.6* for inlet pressure requirement.

Do not continue to adjust the regulator if the pressure is not changing.

If the inlet pressure is too low to allow correct burner pressure setting, then the gas inlet pressure must be corrected before completing the start-up.

11.2.2.4 Check Gas Rate (Single and Two-Stage)

1. After burner pressure adjustment, allow the heater to operate for at least 15 minutes and then re-check settings. Adjust pressure setting if necessary.
2. Check gas flow rate at gas meter.
   NOTE: For two stage valve, (High/Low operation) check gas flow in both operating modes.
3. Turn off heater and electrical supply.
4. Remove the manometer and refit all covers to the valve and tighten the screw of the outlet pressure tap.

11.2.2.5 Check Gas Rate (Modulating)

1. After burner pressure adjustment, allow heater to operate for at least 15 minutes and then recheck settings. Adjust pressure setting if necessary.
2. Check high/low fire gas flow rate at gas meter. To place heater into high fire, disconnect modulating thermostats signal and apply 10 VDC to modulating input connections.
3. To place heater into low fire, disconnect 10 VDC from modulating input connections.
4. Turn off heater and electrical supply.
5. Remove manometer, tighten outlet pressure tap screw and replace modulating thermostat signal wires.

11.3 Pressure Switch

The pressure switch is factory pre-set for each model and is not adjustable.

11.4 Turning Off the Heater

Set the thermostat to the ''OFF'' position or lowest setting and the main burner will stop.

11.5 External Controls

External controls may include time switch, interlock switch, room thermostat and frost thermostat. Operate each control to ensure that they function correctly. Set the switches (if fitted) and thermostat(s) to the users' requirements.

11.6 Complete Start-Up

Ensure that all covers are fitted correctly and all test points are properly sealed.

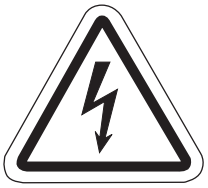
11.7 Instruction to the User

Explain the controls of the heater to the user including how to turn it on and off, using the controls fitted on site.

Give this manual to the user.

Ensure that the user is shown and understands the importance of maintaining clearances to combustibles *on Page 7, Figure 4*, installer responsibility *on Page 5, Section 2* and user instructions *on Page 33, Section 12* and all warnings defined in this manual.

SECTION 12: USER INSTRUCTIONS

⚠ DANGER	⚠ WARNING		
			
Electrical Shock Hazard **Disconnect electric before service.** **Heater must be connected to a properly grounded electrical source.**	**Explosion Hazard** **Turn off gas supply to heater before service.**	**Burn Hazard** **Allow heater to cool before service.** **Tubing may still be hot after operation.**	**Cut/Pinch Hazard** **Wear protective gear during installation, operation and service.** **Edges are sharp.**
Failure to follow these instructions can result in death, electric shock, injury or property damage.			

The UHD[T][M][X][S][R] Series heaters are fully automatic and operate from the external controls fitted on site.

12.1 Heater Operation

When the heater has been switched on by the thermostat installed on site, the main burner will automatically turn on.

The burner control module will control the safe ignition of the flame.

If equipped with two stage gas valve, the heater may start in low or high fire.

If equipped with a modulating gas valve, heater will start at firing rate called for by modulating thermostat. Heater will continue to run at firing rate called for by thermostat, with 10 VDC being maximum rate and 0 VDC being minimum rate. ON/OFF control is provided by thermostat R and W connections. *See Page 20, Section 10.2*.

All heaters require a constant gas and electricity supply which must not be interrupted during the normal operation of this heater.

12.2 Lighting Instructions

12.2.1 To Turn On Heater

1. Ensure that the electrical and gas supplies to the heater are on. Check that the on site controls are "ON".

IMPORTANT: The thermostat setting must be above the ambient temperature for the heater to operate.

2. The automatic firing sequence will begin as described *on Page 29, Figure 14*. The heater will now operate automatically under the control of the on site controls.

12.2.2 To Turn Heater Off

Set the thermostat to the "OFF" position or lowest setting.

The burner will turn off immediately.

To restart, turn the thermostat on or above room temperature.

12.3 Simple Troubleshooting

Some possible reasons for the heater not operating are:

1. Gas supply not "ON".
2. Electricity supply not "ON".
3. The time and/or temperature controls are not "ON".
4. A limit switch may have operated. This may be caused by an interruption of the electrical supply, failure of the distribution fan or vent or heat exchanger blockage.

If a temperature limit switch persistently trips, there is a fault which must be investigated by a contractor qualified in the installation and service of gas-fired heating equipment.

12.3.1 Simple Troubleshooting (Burner Faults)

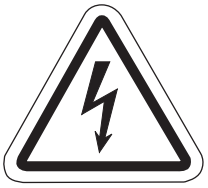
If the burner fails to ignite for any reason, it will retry for ignition (four trials total). After four unsuccessful ignition trials, the control will put the heater into lockout for one hour.

Lockout should not occur during normal operation of the heater and indicates there is a fault condition which must be corrected. There is an LED light on the ignition control that flashes codes to assist in fault correction. *See Page 34, Figure 18* for LED indication codes.

Figure 18: LED Diagnostic Codes

LED INDICATION	FAULT MODE
Slow Flash	Normal Operation - No call for heat.
Fast Flash	Normal Operation - Call for heat.
2 Flashes	Ignition Lockout - No flame detected.
3 Flashes	Airflow Fault - Pressure switch open or closed.
4 Flashes	Temperature Limit Switch Open
5 Flashes	Flame Sense Error - Gas valve not energized.
Steady On	Internal Control Failure

SECTION 13: SERVICING

⚠ DANGER	⚠ WARNING		
			
Electrical Shock Hazard **Disconnect electric before service.** **Heater must be connected to a properly grounded electrical source.**	**Explosion Hazard** **Turn off gas supply to heater before service.**	**Burn Hazard** **Allow heater to cool before service.** **Tubing may still be hot after operation.**	**Cut/Pinch Hazard** **Wear protective gear during installation, operation and service.** **Edges are sharp.**
Failure to follow these instructions can result in death, electric shock, injury or property damage.			

13.1 Servicing Instructions

After start-up, the heater will require maintenance to be carried out, at a minimum, annually. If the heater is used in a dirty or dusty area, more frequent maintenance may be required.

IMPORTANT: Prior to any maintenance or service of the heater, shut off, lockout and tagout the electrical disconnect and gas valve that supplies the unit in accordance with OSHA regulations. After any maintenance or repair work, always test fire the heater in accordance with the start-up instructions *on Page 28, Section 11 through Page 32, Section 11.7* to ensure all safety systems are in working order before leaving the heater to operate. Minor faults may be traced by using the troubleshooting charts *on Page 38, Section 14 through Page 42, Section 14.5*.

IMPORTANT: Check all gas pipes and pipe joints to ensure there are no cracks or gas leaks. Any cracks in the pipes or pipe joints must be repaired.

IMPORTANT: Inspect all suspended components and hardware. Ensure that they are in good condition, properly tightened, and corrosion free.

13.2 Burner Maintenance

13.2.1 Burner Maintenance for Models 150-400

1. Open the hinged door via tooled access and remove from the hinges. Set door aside. *See Page 44, Section 15.2*.
2. Remove the filler panel (10 screws) to fully access the burner assembly. *See Page 44, Section 15.2.1*.
3. Remove burner assembly from cabinet via screws around the burner assembly (quantity will vary). *See Page 44, Section 15.2.1*. Electrode and flame probe should remain attached.
4. Remove manifold from burner assembly via four screws, two on top and two on bottom. *See Page 45, Section 15.2.2*. Clean any deposits from the main burner which may have formed in the injectors or venturi of the burner.
5. Check condition of ignition electrode and flame probe. Clean off any deposits which may have formed, check condition of ceramic insulators. Replace as required. *See Page 46, Section 15.3*.

13.3 Heat Exchanger Maintenance

The heat exchanger will remain clean unless a problem has developed with combustion. Inspect the heat exchanger. Look for signs of overheating at the front of the tubes which may indicate burner over firing or persistently low air flows.

13.4 Gas Valve Maintenance

No regular maintenance is required on this device. To change gas control valves, *See Page 43, Section 15.1*.

Do not repair or disassemble gas valve.

Replace faulty gas valves with replacement parts sold and supplied by Roberts-Gordon LLC.

13.5 Flue Blower

The flue blower should not require maintenance. However, if the air pressure switch is causing burner lockout, then remove the flue blower from the vent box by unscrewing the screws at the mounting plate. Screw quantity will vary by model size. Remove the screws attaching the mounting plate to the fan inlet. *See Page 47, Section 15.5 through Page 48, Section 15.6*. Ensure that the fan is free to run and

that the fan wheel is clean.

13.6 Venting and Air Intake Pipe

Inspect all venting and air intake pipe. Ensure that all seams are sealed and suspension points secure. Repair suspension points if any part of the venting or combustion air pipe is sagging. Check to make sure any insulation is not missing or in poor condition. Replace as necessary. Check all venting and air intake components to ensure they are in good condition, gas tight and corrosion-free.

13.7 Maintenance Checklist

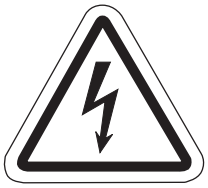
Installation Code and Annual Inspections: All installation and service of ROBERTS GORDON® equipment must be performed by a contractor qualified in the installation and service equipment sold and supplied by Roberts-Gordon LLC and conform to all requirements set forth in the ROBERTS GORDON® manuals and all applicable governmental authorities pertaining to the installation, service, operation and labeling of the equipment.

To help facilitate optimum performance and safety, Roberts-Gordon LLC recommends that a qualified contractor conduct, at a minimum, annual inspections of your ROBERTS GORDON® equipment and perform service where necessary, using only replacement parts sold and supplied by Roberts-Gordon LLC.

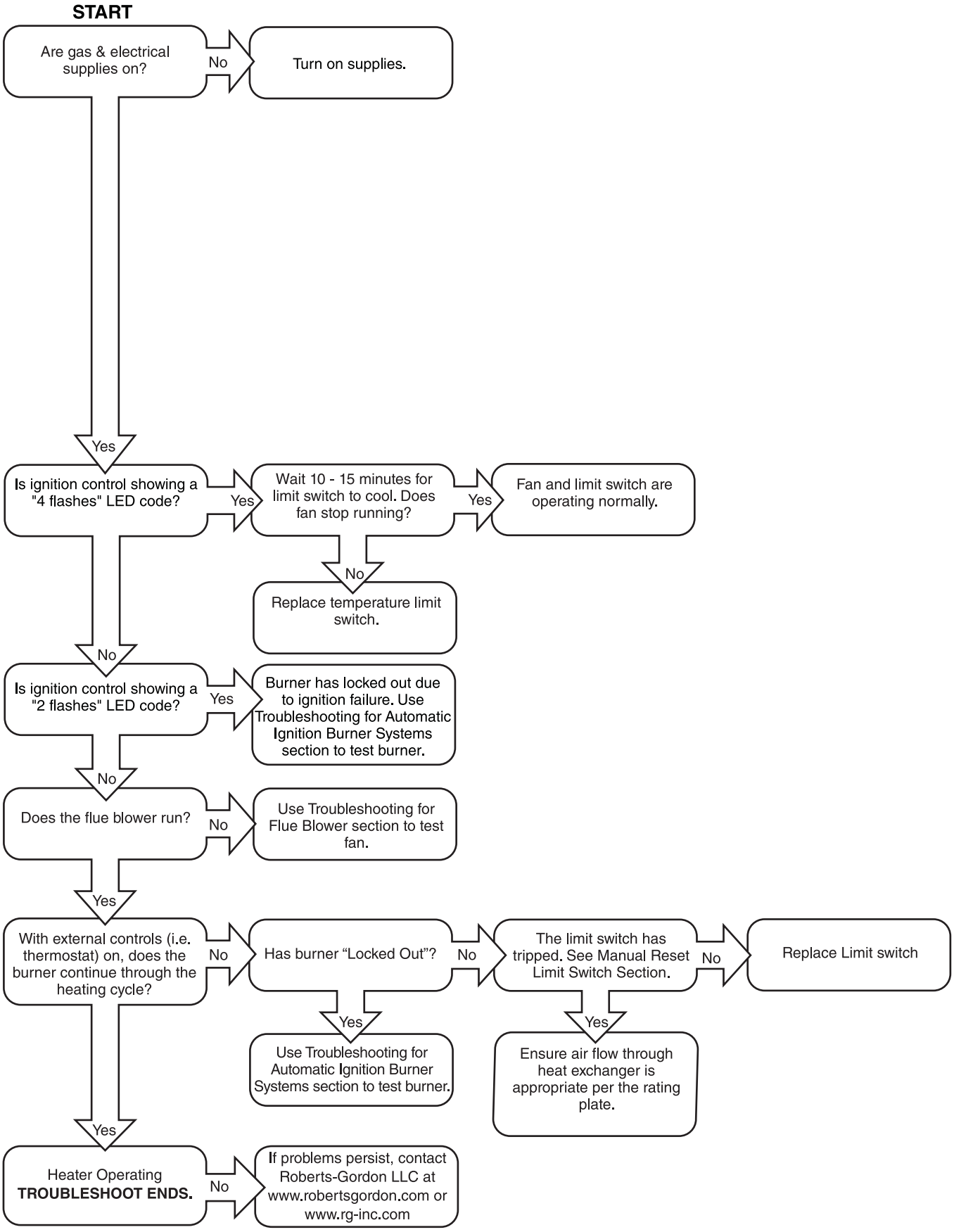
Annual Fall Start Up	Follow entire start-up procedure at this time and check control settings and operation.
The Vicinity of the Heater	Do not store or use flammable objects, liquids or vapors near the heater. Immediately remove these items if they are present. *See Page 6, Section 3*.
Vehicles and Other Objects	Maintain the clearances to combustibles. Do not hang anything from, or place anything on, the heater. Make sure nothing is lodged in between the heat exchanger tubes. Immediately remove objects in violation of the clearances to combustibles. *See Page 7, Section 4*.
Vent Pipe/Terminals	Venting must be intact. Using a flashlight, look for obstructions, cracks on the pipe, gaps in the sealed areas or corrosion. The area must be free of dirt and dust. Remove any carbon deposits or scale using a wire brush. If the vent terminal has a screen built in, remove any dirt, dust or deposits from the screen. *See Page 11, Section 7 through Page 17, Section 8*.
Cabinet Exterior	After installation, touch up scratches. Periodic painting should be done thereafter as required. Warning labels and logo labels should be legible and accurate. Please contact Roberts-Gordon LLC or ROBERTS GORDON® independent distributor if you need replacement warning labels or logo labels. *See Page 2, Figure 1 through Page 4, Figure 3*.
Combustion Air Intake Pipe	Intake pipe and inlet must be intact. Look for obstructions, cracks on the pipe, gaps in the sealed areas or corrosion. The area must be free of dirt and dust. Clean and reinstall as required. *See Page 17, Section 8*.

Heat Exchanger	Make sure there are no cracks. Make sure there is no sagging, bending or distortion. Clean or replace as required.
Gas Line and Shut-off Valves	Check for gas leaks. *See Page 18, Section 9*.
Burner Observation Window	Make sure it is clean and free of cracks or holes. Clean and replace as required.
Flue Blower Scroll, Wheel and Motor	Compressed air or a vacuum cleaner may be used to clean dust and dirt.
Inshot Burners and Orifices	Clear obstructions (even spider webs will cause problems). Carefully remove any dust and debris from the burner.
Direct-Spark Igniter	Replace if there are cracked ceramics, excessive carbon residue, or erosion of the electrode. The electrode gap should be 1/8" (3.2 mm).
Thermostat	There should be no exposed wire or damage to the device or wiring. *See Page 20, Section 10*.
Suspension Points	Make sure the heater is hanging securely. Look for signs of wear on the suspension materials or ceiling. *See Page 10, Figure 6*.
Silicone Tubing	Ensure tight, secure fit on all pressure fittings at pressure switch and vent box.
Gas Valve	Verify that cap covering pressure regulator adjustment screw is secure and has not been tampered with. Verify all wiring connections.
Condensate Drain (when installed)	Flush drain and clear any obstructions.
Ductwork	Consult an indoor air quality professional for proper cleaning procedures
Air Circulation Blower	For a complete inspection, see the manufacturer's Installation, Operation and Service manual.
Wall Tag	If wall tag is present, make sure it is legible and accurate. Please contact Roberts-Gordon LLC or your ROBERTS GORDON® independent distributor if you need a wall tag. *See Page 5, Section 2.1*.

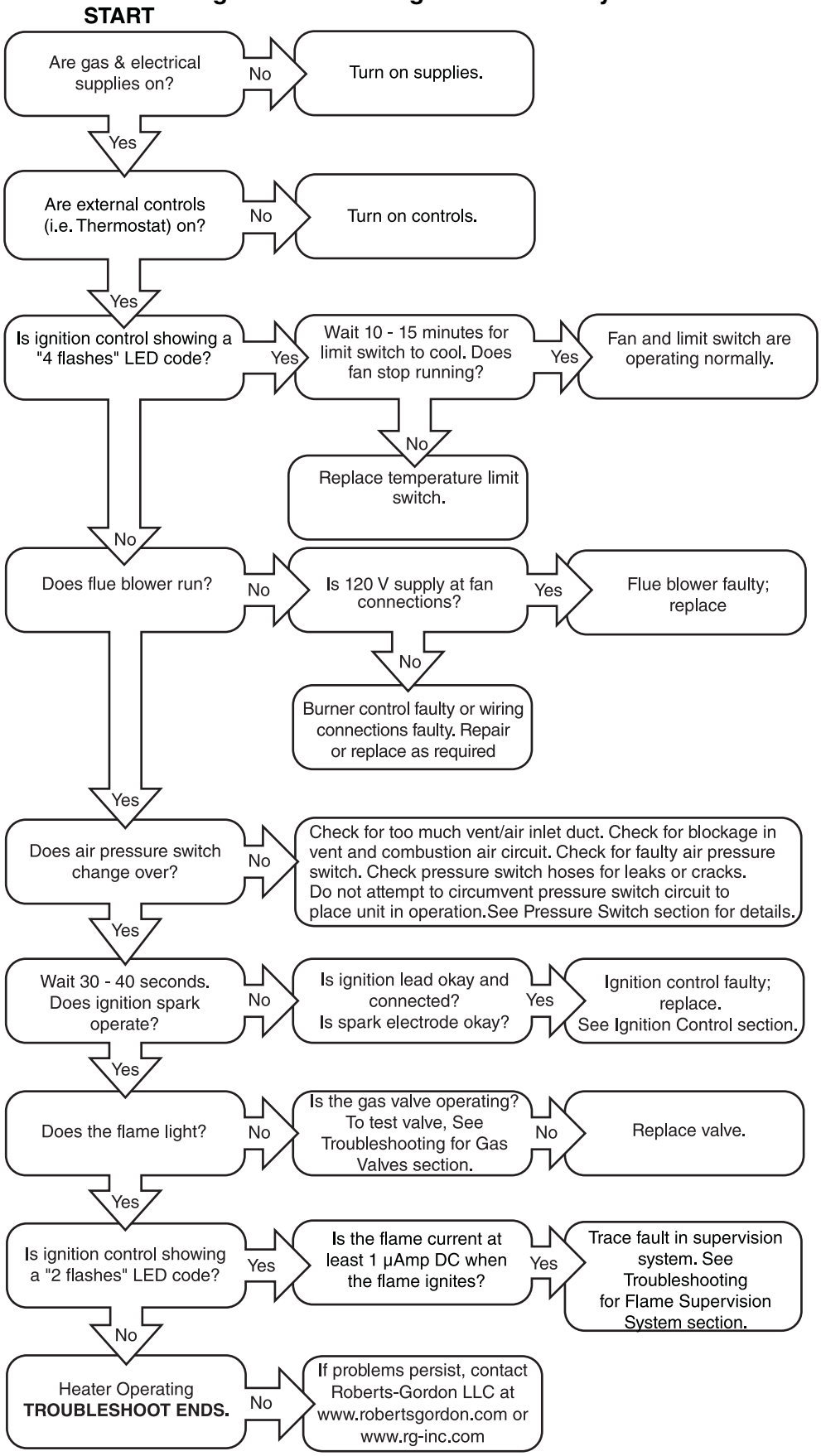
SECTION 14: TROUBLESHOOTING

⚠ DANGER	⚠ WARNING		
			
Electrical Shock Hazard **Disconnect electric before service.** **Heater must be connected to a properly grounded electrical source.**	**Explosion Hazard** **Turn off gas supply to heater before service.**	**Burn Hazard** **Allow heater to cool before service.** **Tubing may still be hot after operation.**	**Cut/Pinch Hazard** **Wear protective gear during installation, operation and service.** **Edges are sharp.**
Failure to follow these instructions can result in death, electric shock, injury or property damage.			

14.1 General


START
Are gas & electrical supplies on?
No
Turn on supplies.
Yes
Is ignition control showing a "4 flashes" LED code?
Yes
Wait 10 - 15 minutes for limit switch to cool. Does fan stop running?
Yes
Fan and limit switch are operating normally.
No
Replace temperature limit switch.
No
Is ignition control showing a "2 flashes" LED code?
Yes
Burner has locked out due to ignition failure. Use Troubleshooting for Automatic Ignition Burner Systems section to test burner.
No
Does the flue blower run?
No
Use Troubleshooting for Flue Blower section to test fan.
Yes
With external controls (i.e. thermostat) on, does the burner continue through the heating cycle?
No
Has burner “Locked Out”?
No
The limit switch has tripped. See Manual Reset Limit Switch Section.
No
Replace Limit switch
Yes
Use Troubleshooting for Automatic Ignition Burner Systems section to test burner.
Yes
Ensure air flow through heat exchanger is appropriate per the rating plate.
Yes
Heater Operating TROUBLESHOOT ENDS.
No
If problems persist, contact Roberts-Gordon LLC at www.robertsgordon.com or www.rg-inc.com

14.2 Troubleshooting For Automatic Ignition Burner Systems

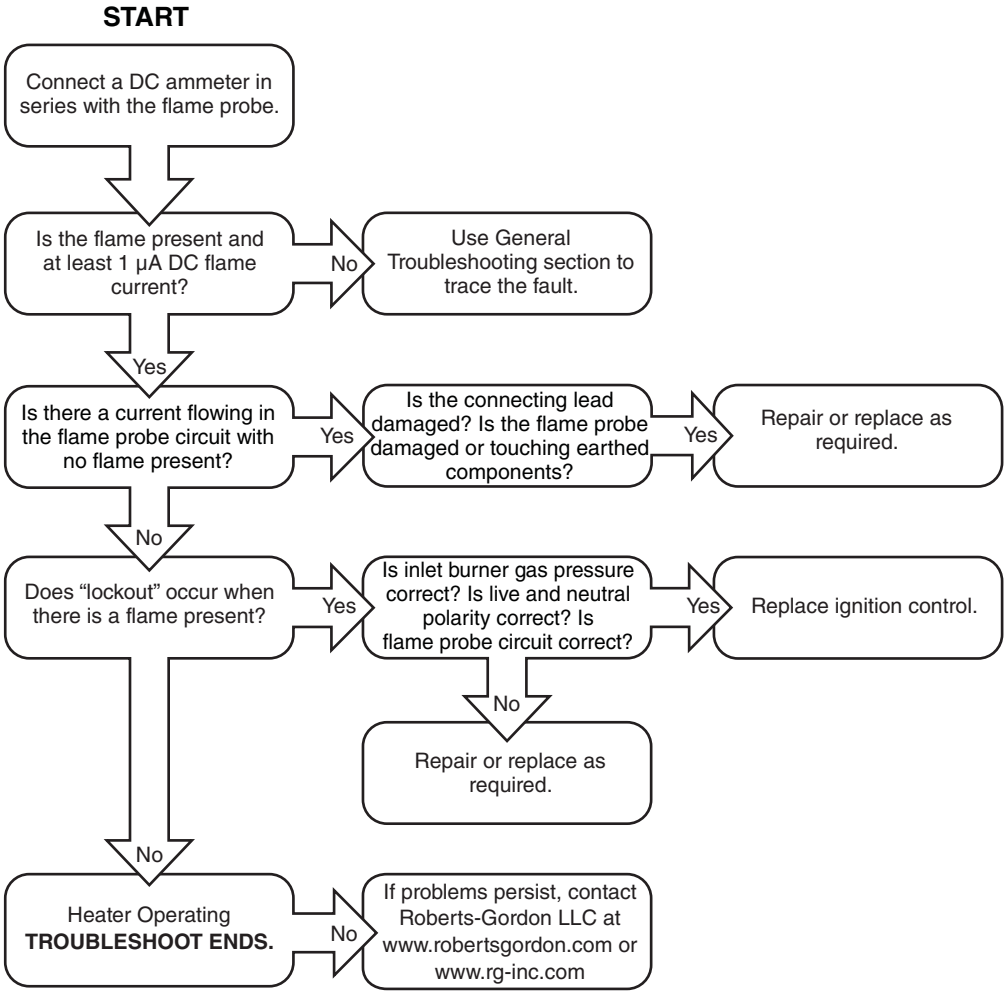


For optimum heater performance, use only replacement parts sold and supplied by Roberts-Gordon LLC.

Conduct start-up procedure as shown *on Page 28, Section 11*.

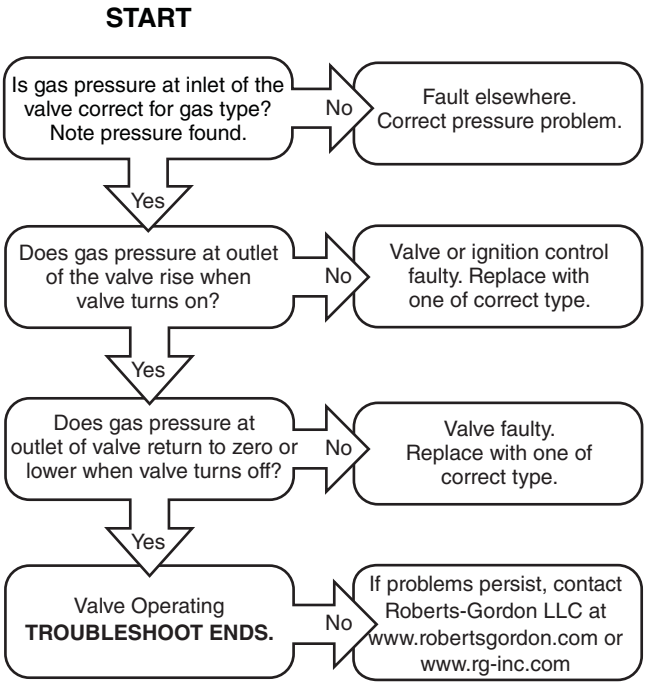
14.3 Troubleshooting for Flame Supervision System

To measure flame current, connect a 0 - 50 µA DC meter in series with the flame probe. If the meter reads negative values, then reverse the test leads.

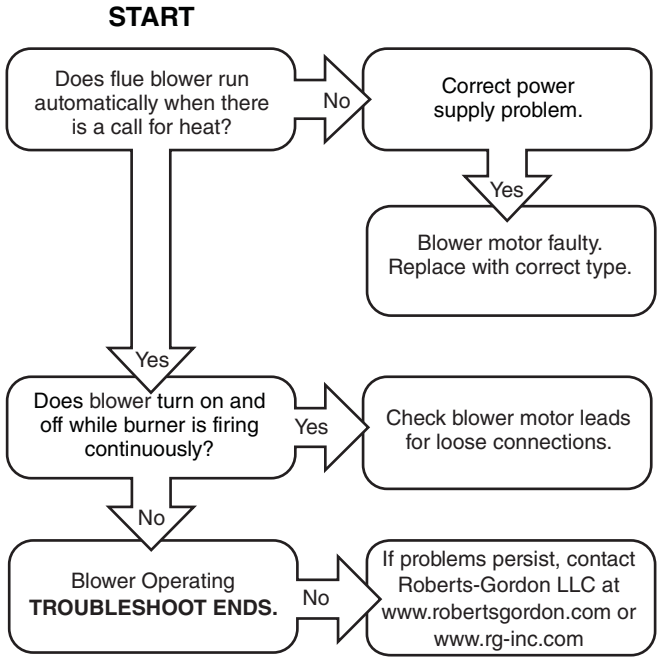


NOTE: Minimum flame probe current 1 µA DC. Typical flame probe current 3-5 µA DC.

14.4 Troubleshooting for Gas Valves



14.5 Troubleshooting for Flue Blower

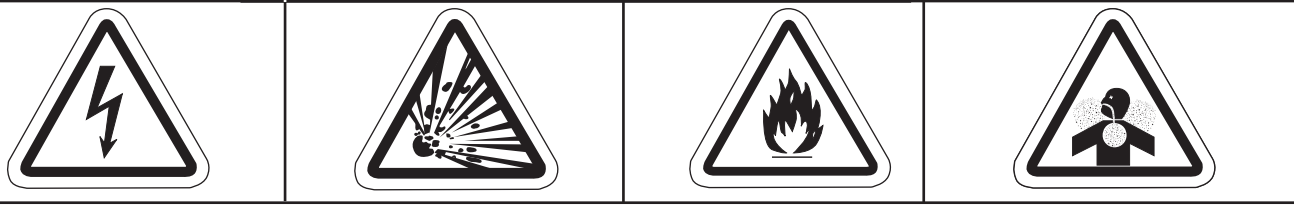


For optimum heater performance, use only replacement parts sold and supplied by Roberts-Gordon LLC.

Conduct start-up procedure as shown *on Page 28, Section 11*.

SECTION 15: REPLACEMENT PARTS

⚠ DANGER | **⚠ WARNING**



Electrical Shock Hazard | **Explosion Hazard** | **Fire Hazard** | **Carbon Monoxide Hazard**

Use only genuine ROBERTS GORDON® replacement parts per this installation, operation and service manual.

Failure to follow these instructions can result in death, electric shock, injury or property damage.

See warnings and important information *on Page 35, Section 13* before removing or replacing parts.

Burner Components

All serviceable burner parts are accessed by the hinged door on the side of the heater.

15.1 Gas Valve

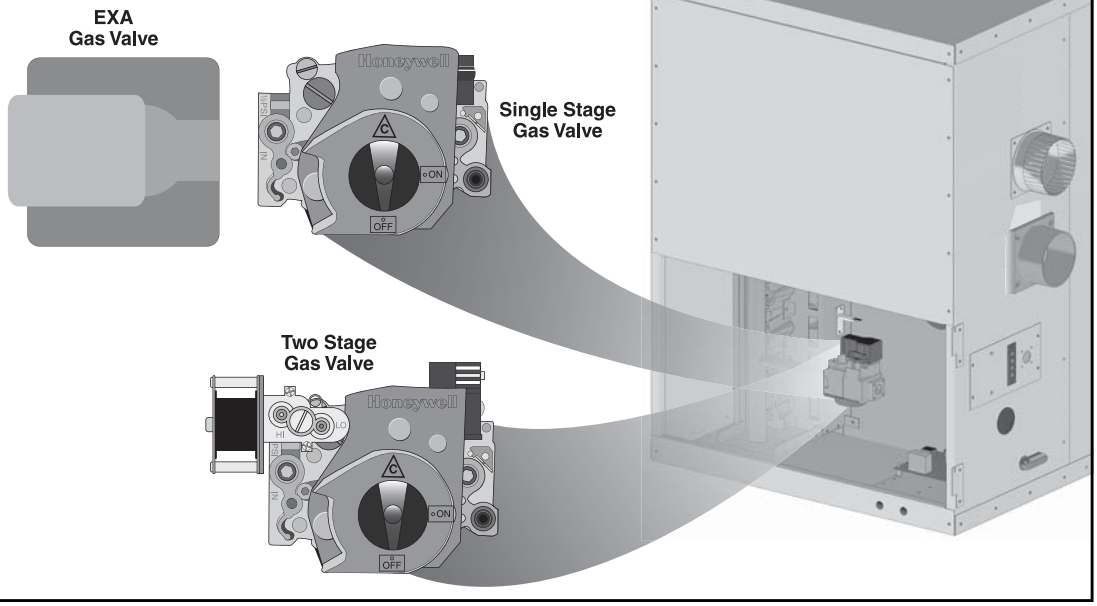
Remove the gas supply pipe at the heater inlet.

Follow instructions *on Page 44, Section 15.2* to remove gas valve/manifold.

Replace in reverse order. Verify that the gas flow direction of the valve is correct. Use a minimum amount of gas seal on the thread joint. Check that all the joints are leak free. Reset gas valve. *See Page 31, Section 11.2.2*.

IT IS IMPORTANT THAT ONLY THE CORRECT GAS VALVE IS USED WHEN REPLACING THESE CONTROLS.

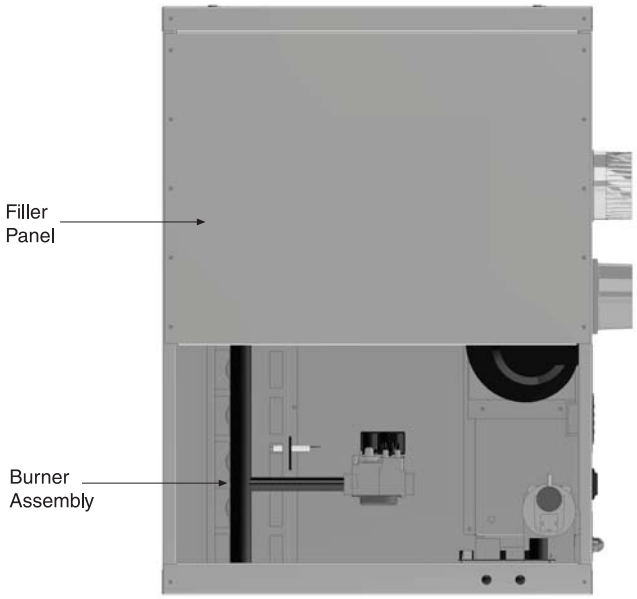
Description	Part Number
Single Stage Gas Valve, NG (Models UHD[X][S][R] 150 - 250)	90032505
Single Stage Gas Valve, LP (Models UHD[X][S][R] 150 - 250)	90032506
Single Stage Gas Valve, NG (Models UHD[X][S][R] 300 - 400)	90032520
Single Stage Gas Valve, LP (Models UHD[X][S][R] 300 - 400)	90032521
Two Stage Gas Valve, NG (Models UHD[T][X][S][R] 150-250)	90032530
Two Stage Gas Valve, LP (Models UHD[T][X][S][R] 150-250)	90032531
Two Stage Gas Valve, NG (Models UHD[T][X][S][R] 300 - 400)	90032532
Two Stage Gas Valve, LP (Models UHD[T][X][S][R] 300 - 400)	90032533
Exa Valve ½" (Models UHD[M][X][S][R] 150-250) NG and LP	90032550
Exa Valve ¾" (Models UHD[M][X][S][R] 300-400) NG and LP	90032551



15.2 Burner Compartment for Models UHD[T][M][X][S][R] 150-400

Side View of Burner Compartment with Hinged Door Removed

Before burner removal, remove the 10 screws holding the filler panel on and remove the filler panel.

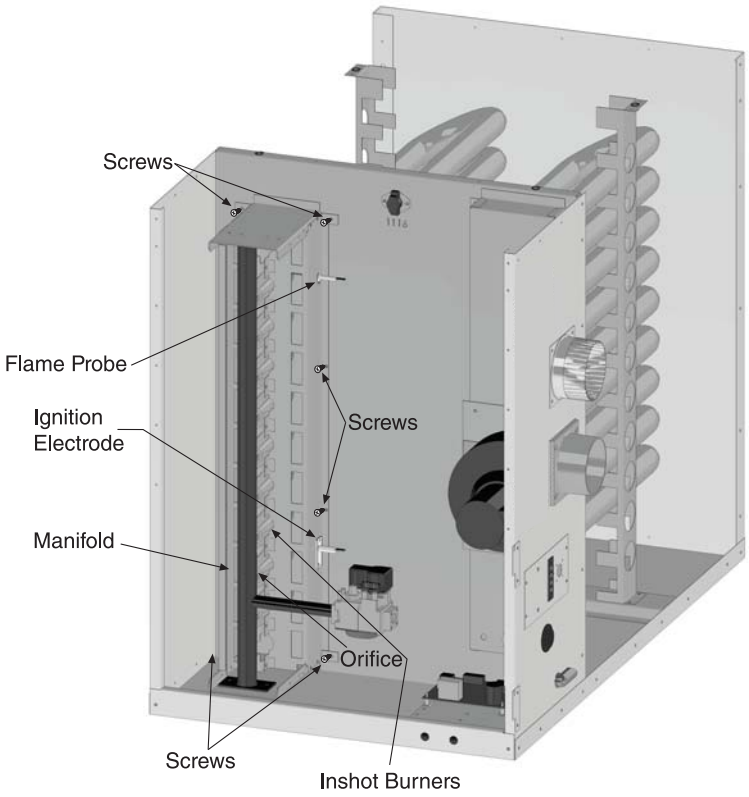


15.2.1 Burner Compartment without Filler Panel for Models UHD[T][M][X][S][R] 150-400

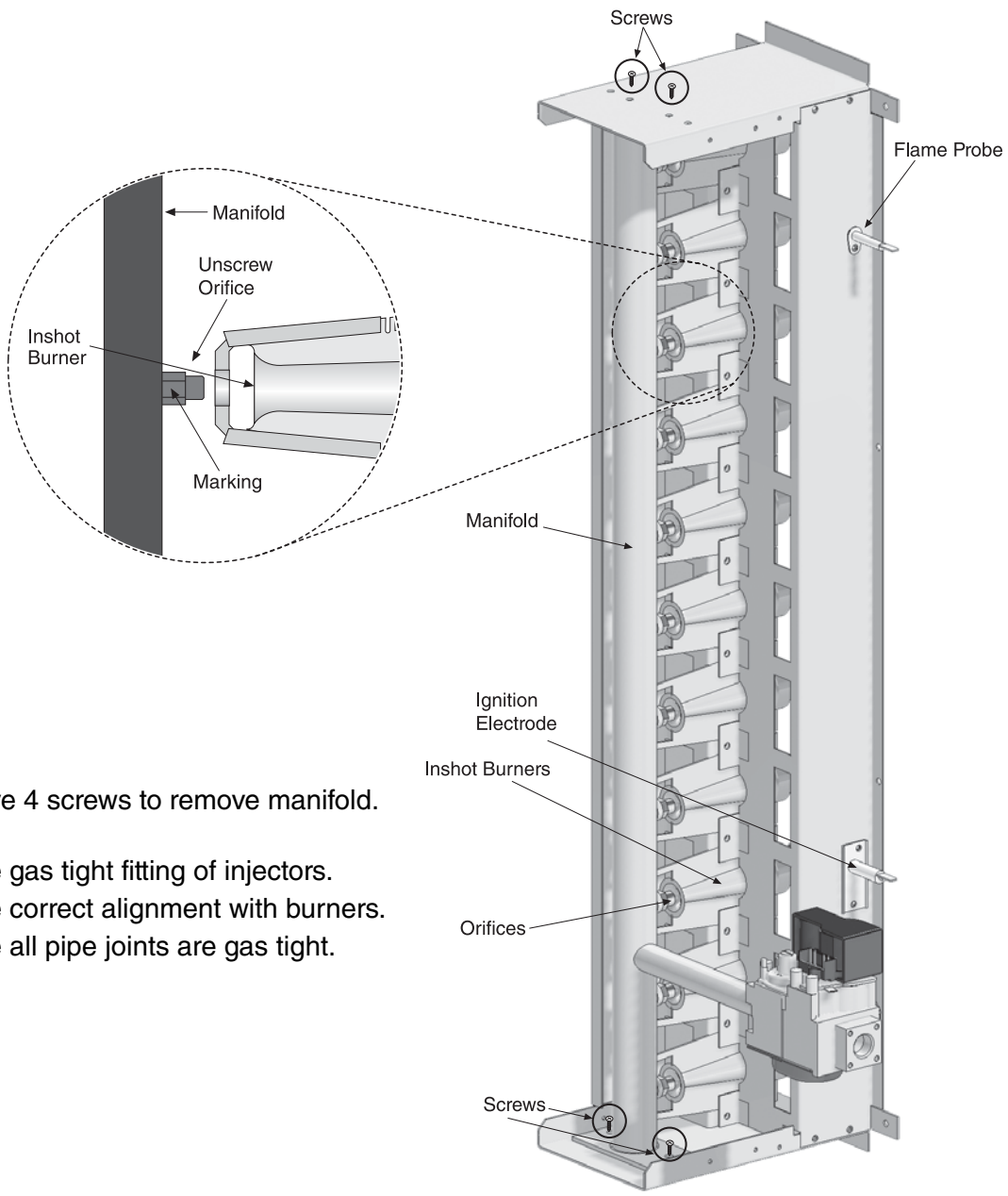
Side View of Burner Compartment with Filler Panel Removed

Burner assembly must be removed to service orifices, manifold or burners.

Following any work, refit components in reverse order.



15.2.2 Burner Injectors for Models UHD[T][M][X][S][R] 150-400



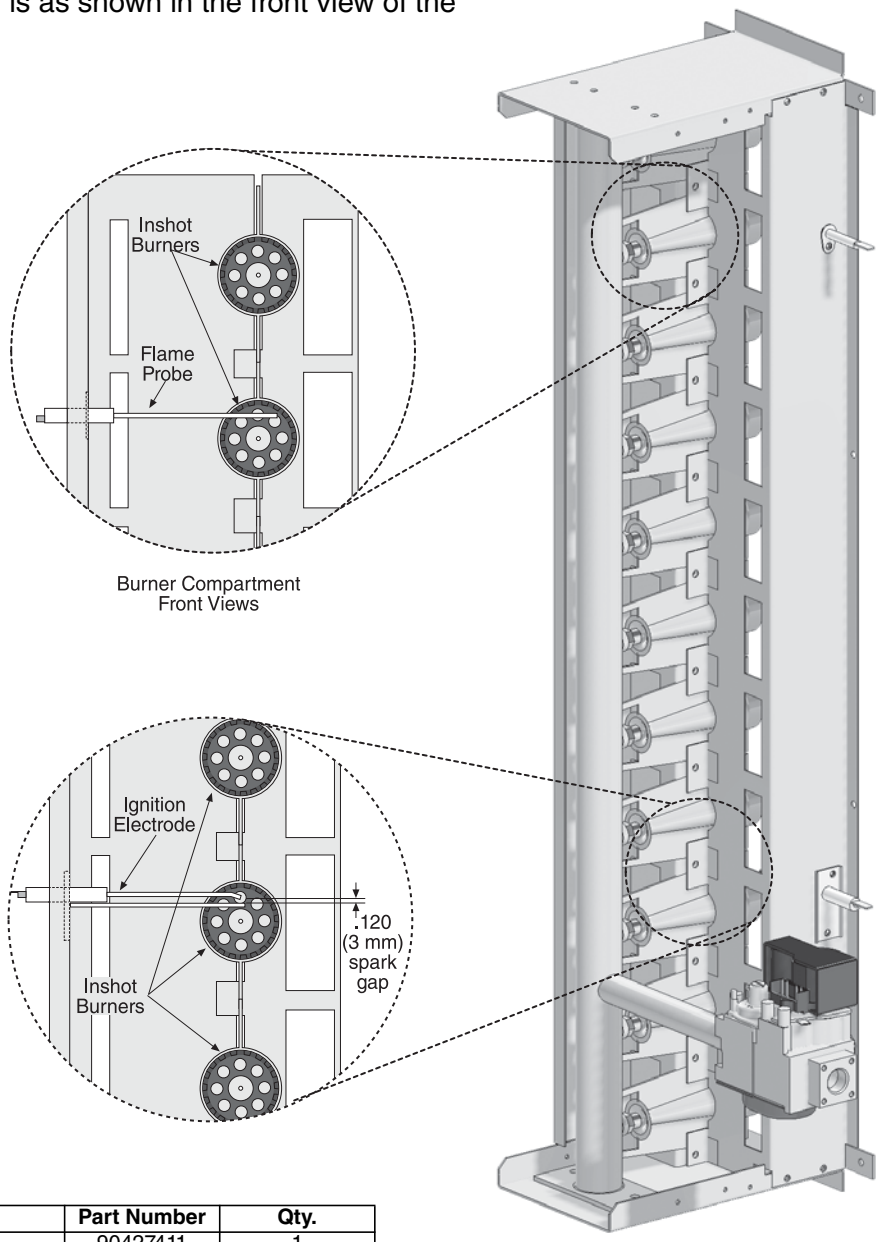
Remove 4 screws to remove manifold.

Ensure gas tight fitting of injectors.
Ensure correct alignment with burners.
Ensure all pipe joints are gas tight.

MODEL	UHD [T][M][X][S][R] 150	UHD [T][M][X][S][R] 175	UHD [T][M][X][S][R] 200	UHD [T][M][X][S][R] 225	UHD [T][M][X][S][R] 250	UHD [T][M][X][S][R] 300	UHD [T][M][X][S][R] 350	UHD [T][M][X][S][R] 400
Orifice Quantity	7	8	9	10	11	12	14	14
Natural Gas								
Orifice Marking	43	43	2.25 mm	2.25 mm	2.25 mm	43	43	40
P/N	91930043	91930043	91930225	91930225	91930225	91930043	91930043	91930040
Propane								
Orifice Marking	1.35 mm	1.35 mm	54	54	54	1.45 mm	53	53
P/N	91930135	91930135	91930054	91930054	91930054	91930145	91930053	91930053

15.3 Ignition Electrode and Flame Probe for Models UHD[T][M][X][S][R] 150-400

To replace the ignition electrode or flame probe, remove the electrical lead and screw. Pull out from mounting. Refit in reverse ensuring that the gap to burner is as shown in the front view of the burner compartment.



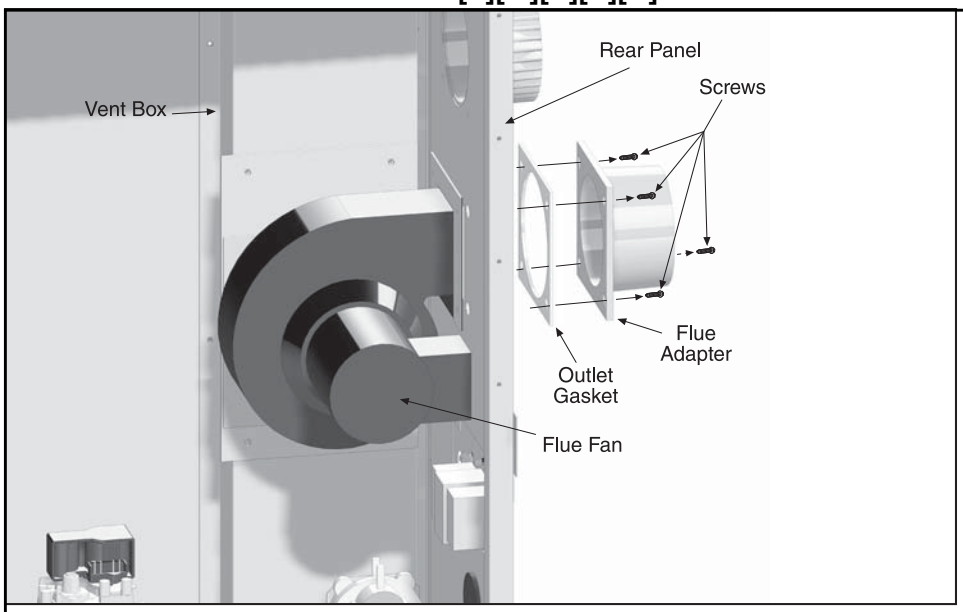
Burner Compartment Front Views

Description	Part Number	Qty.
Spark Electrode	90427411	1
Automatic Ignition Flame Probe	90439300	1
Transformer	90436900K	1
Ignition Module	90434008	1
Inshot Burners UHD[T][M][X][S][R] 150	92000001	7
Inshot Burners UHD[T][M][X][S][R] 175	92000001	8
Inshot Burners UHD[T][M][X][S][R] 200	92000000	9
Inshot Burners UHD[T][M][X][S][R] 225	92000000	10
Inshot Burners UHD[T][M][X][S][R] 250	92000000	11
Inshot Burners UHD[T][M][X][S][R] 300	92000000	12
Inshot Burners UHD[T][M][X][S][R] 350	92000000	14
Inshot Burners UHD[T][M][X][S][R] 400	92000000	14
Limit Switch (150 - 400) [300 - 400 LOWER]	90412103	1
Limit Switch (300 - 400) [UPPER]	90412105	1

15.4 Heat Exchanger

The heat exchanger consists of a four-pass design with 1.75" outer diameter [409 stainless steel] tube. The tube plates are made of [aluminized steel] [409 stainless steel]. The tube supports are made of [aluminized steel] [409 stainless steel].

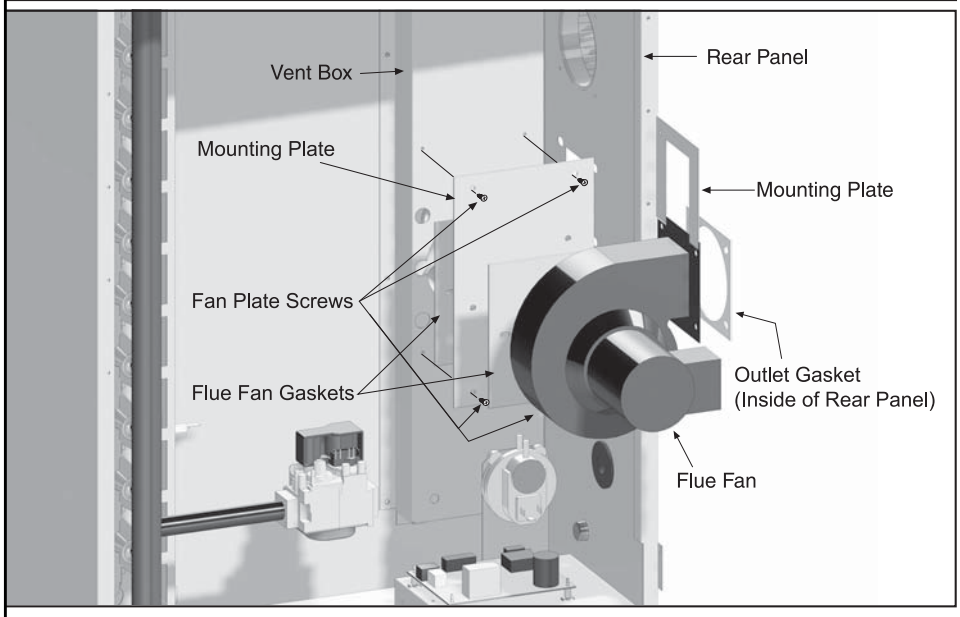
15.5 Flue Blower for Models UHD[T][M][X][S][R] 150-300



Remove screws securing outlet flange to the flue adapter.

Refit in reverse order.

Disconnect electrical connections at plug in tabs.



Remove screws securing flue fan mounting plate to vent box.

Remove screws securing mounting plate to fan. (Not shown)

Refit in reverse.

Use new gaskets.

Ensure sealed joints.

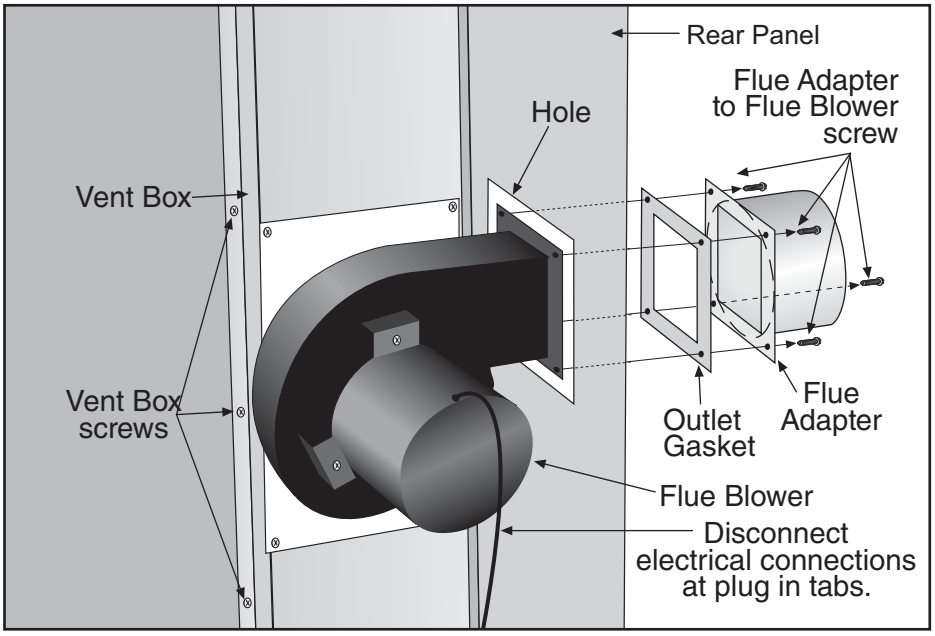
Ensure mounting plate orifice is clear and not obstructed.

MODEL	UHD[T][M][X][S][R] 150 - 300
Flue Blower P/N	90710403

IT IS IMPORTANT THAT ONLY THE CORRECT FLUE BLOWER SPECIFIED FOR EACH MODEL TYPE IS USED WHEN REPLACING THESE ITEMS.

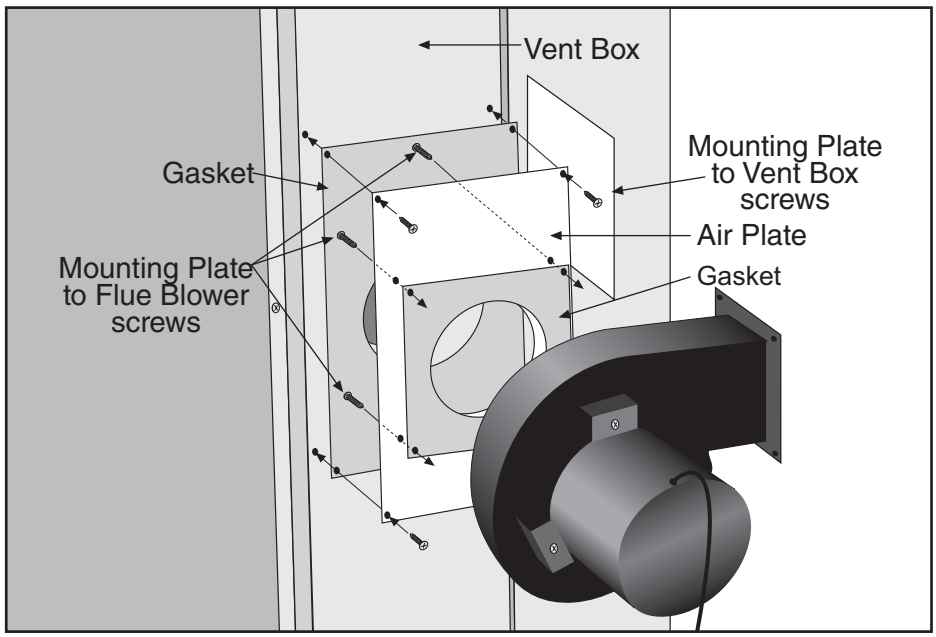
Carry out a start-up after working on or changing a flue blower. *See Page 28, Section 11*.

15.6 Flue Blower for Models UHD[T][M][X][S][R] 350-400



Remove screws securing outlet flange to the flue adapter.

Refit in reverse order.



Remove screws securing flue blower mounting plate to vent box.

Remove screws securing mounting plate to blower.

Refit in reverse.

Use new gaskets.

Ensure sealed joints.

Ensure mounting plate orifice is clear and not obstructed.

MODEL	UHD[T][M][X][S][R] 350 - 400
Flue Blower P/N	90710402

IT IS IMPORTANT THAT ONLY THE CORRECT FLUE BLOWER SPECIFIED FOR EACH MODEL TYPE IS USED WHEN REPLACING THESE ITEMS.

Carry out a start-up after working on or changing a flue blower. *See Page 28, Section 11*.

15.7 Pressure Switch

⚠ WARNING

Carbon Monoxide Hazard

Use correct pressure switch specified for each model.

Use of incorrect pressure switch or disabling pressure switch circuit could cause unsafe condition.

Failure to follow these instructions can result in death or serious injury.

Pull off 3 way connector. Spring open plastic clips of mounting cradle. Replace with correct type of pressure switch for model. The pressure switches are color coded for each pressure setting. Carry out a start-up after working on or changing a pressure switch. *See Page 28, Section 11*.

MODEL	UHD [T][M][X][S][R] 150 - 175	UHD [T][M][X][S][R] 200 - 225	UHD [T][M][X][S][R] 250	UHD [T][M][X][S][R] 300	UHD [T][M][X][S][R] 350	UHD [T][M][X][S][R] 400
Pressure Switch Kit P/N	90439803	90439808	90439812	90439811	90439805	90439811
Color Code	grey	orange	orange	grey	blue	grey
Set Point (in wc)	0.41	0.79	0.18	0.72	0.55	0.72
Pressure Switch Snap Ring P/N	90439850	90439850	90439850	90439850	90439850	90439850

15.8 Ignition Control

The control mounts to the electrical plate. Pull out ignition cable and wiring from board, noting their positions. Release the four mounting standoffs. Refit in reverse. Ensure correct location of ignition cable and all other wiring.

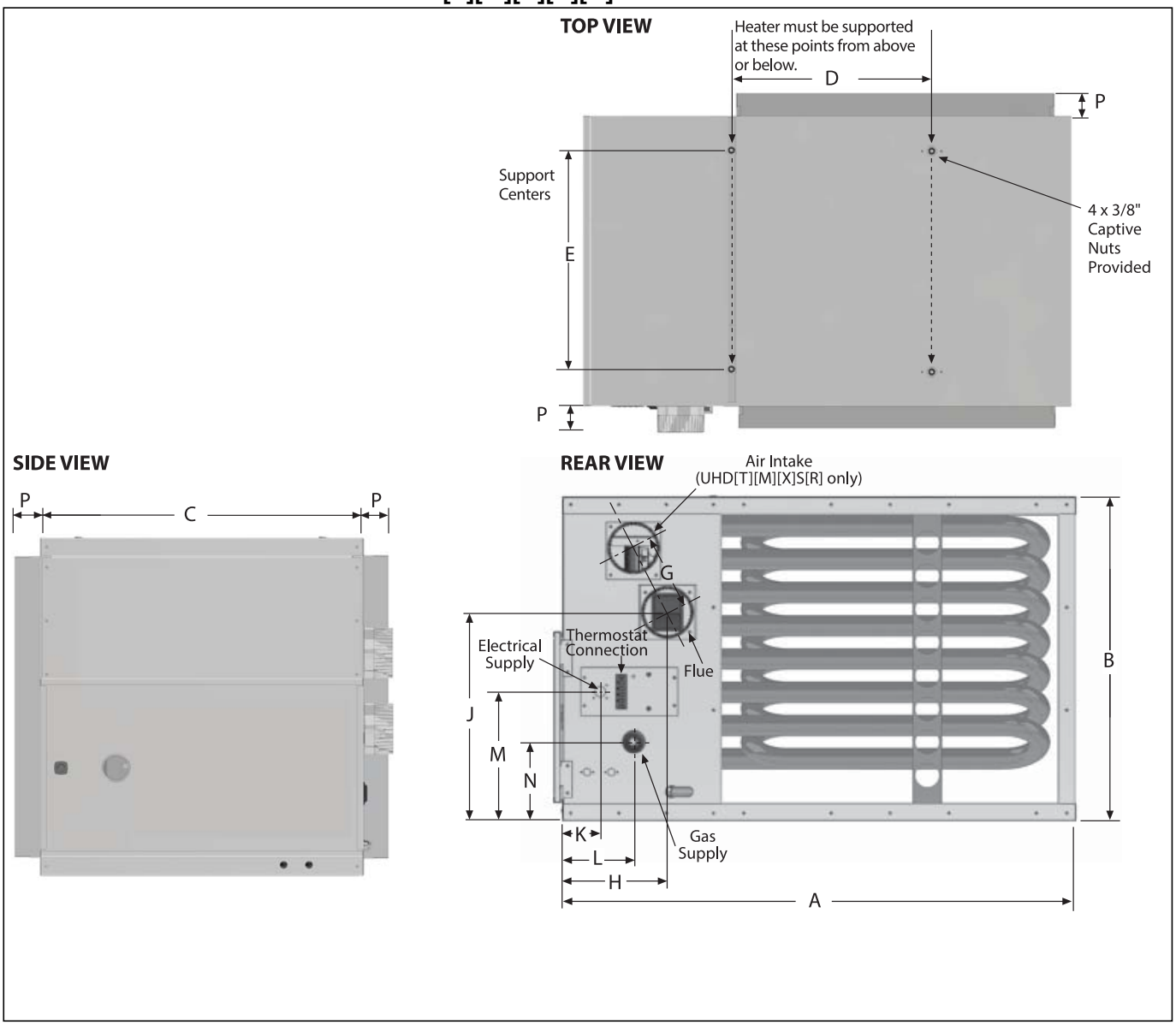
15.9 Limit Switches

15.9.1 Removal and Replacement

1. Remove the electrical connections to the switch.
2. Unscrew the two screws securing the switch.
3. Fit a new switch with two screws.
4. Reconnect the electrical connections and test operation.

SECTION 16: SPECIFICATIONS

16.1 Dimension Data for Models UHD[T][M][X][S][R] 150-250



Model		UHA[T][M][X][S][R] 150	UHA[T][M][X][S][R] 175	UHA[T][M][X][S][R] 200	UHA[T][M][X][S][R] 225	UHA[T][M][X][S][R] 250
A	in (cm)	42.4 (107.7)	42.4 (107.7)	42.4 (107.7)	42.4 (107.7)	42.4 (107.7)
B	in (cm)	26.7 (67.8)	26.7 (67.8)	35.0 (88.9)	35.0 (88.9)	35.0 (88.9)
C	in (cm)	25.5 (64.8)	25.5 (64.8)	25.5 (64.8)	25.5 (64.8)	25.5 (64.8)
D	in (cm)	17.6 (44.7)	17.6 (44.7)	17.6 (44.7)	17.6 (44.7)	17.6 (44.7)
E	in (cm)	19.4 (49.3)	19.4 (49.3)	19.4 (49.3)	19.4 (49.3)	19.4 (49.3)
G	in (cm)	6.0 (15.2)	6.0 (15.2)	6.6 (16.8)	6.6 (16.8)	6.6 (16.8)
H	in (cm)	8.7 (22.1)	8.7 (22.1)	8.6 (22)	8.6 (22)	8.6 (22)
J	in (cm)	17.2 (43.7)	17.2 (43.7)	17.7 (45)	17.7 (45)	17.7 (45)
K	in (cm)	3.1 (7.9)	3.1 (7.9)	8.1 (20.6)	8.1 (20.6)	8.1 (20.6)
L	in (cm)	5.9 (15)	5.9 (15)	5.7 (14.5)	5.7 (14.5)	5.7 (14.5)
M	in (cm)	10.7 (27.2)	10.7 (27.2)	10.5 (26.7)	10.5 (26.7)	10.5 (26.7)
N	in (cm)	6.5 (16.5)	6.5 (16.5)	6.5 (16.5)	6.5 (16.5)	6.5 (16.5)
P	in (cm)	2.0 (5.08)	2.0 (5.08)	2.0 (5.08)	2.0 (5.08)	2.0 (5.08)

16.2 General Technical Data Table

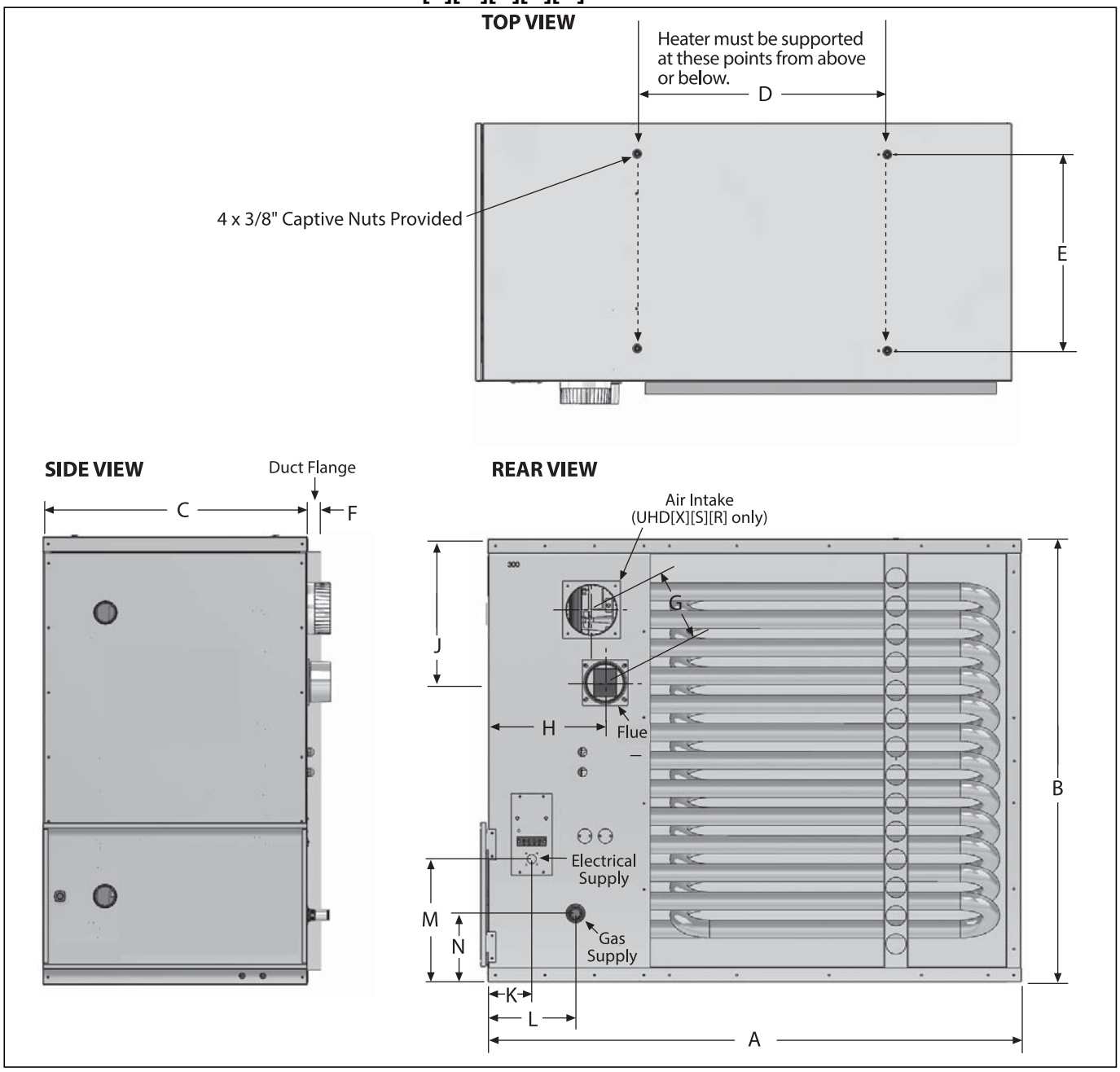
	Model	UHD [T][M][X][S][R] 150	UHD [T][M][X][S][R] 175	UHD [T][M][X][S][R] 200	UHD [T][M][X][S][R] 225	UHD [T][M][X][S][R] 250
Full Load Amps @ 120 V	A	2	2	2	2	2
Minimum Air Volume	CFM	1360	1400	2050	2100	2350
Temperature Rise @ Minimum Air Volume	°F (°C)	83 (46)	95 (52)	73 (40)	80 (44)	80 (44)
Heat Exchanger Pressure Drop @ Minimum Air Volume	in wc	0.02	0.03	0.025	0.035	0.05
Maximum Air Volume	CFM	5800	6850	7750	8300	8850
Temperature Rise @ Maximum Air Volume	°F (°C)	20 (11)	20 (11)	20 (11)	20 (11)	22 (12)
Heat Exchanger Pressure Drop @ Maximum Air Volume	in wc	0.16	0.29	0.163	0.253	0.35
Flue Size*	in (cm)	4 - All Models (10)				
Air Intake*	in (cm)	4 - All Models (10)				
Duct Size (Width)	28 (71)	28 (71)	28 (71)	28 (71)	28 (71)	28 (71)
Duct Size (Height)	24 (61)	24 (61)	32.5 (83)	32.5 (83)	32.5 (83)	32.5 (83)
Weight (Net)	lb (kg)	191 (86.6)	211 (95.7)	239 (108.4)	249 (112.9)	254 (115.2)

** Do not exceed the maximum length of flue stated or heater may not operate properly.*

16.3 Technical Data Table

	Model	UHD [T][M][X][S][R] 150	UHD [T][M][X][S][R] 175	UHD [T][M][X][S][R] 200	UHD [T][M][X][S][R] 225	UHD [T][M][X][S][R] 250
Total Input High Fire	(Btu/h) x (1000)	150	175	200	225	250
Total Input Low Fire	(Btu/h) x (1000)	105	122.5	140	157.5	175
Total Output High Fire	(Btu/h) x (1000)	123	143.5	164	184.5	205
Total Output Low Fire	(Btu/h) x (1000)	86	100	115	129	143.5
Efficiency (Max Input)	%	82	82	82	82	82
Natural Gas Data - Inlet Pressure 5.0 in wc Min., 14 in wc Max.						
Burner Pressure High Fire	in wc	3.0	3.0	3.2	3.4	3.45
Burner Pressure Low Fire	in wc	1.3	1.3	1.6	1.7	1.7
LPG / Propane Data - Inlet Pressure 12.0 in wc Min., 14 in wc Max.						
Burner Pressure High Fire	in wc	11.1	11.2	9.5	11.1	11.6
Burner Pressure Low Fire	in wc	5.0	5.5	4.7	5.4	5.5

16.4 Dimension Data for Models UHD[T][M][X][S][R]300-400



Model		A	B	C	D	E	F	G	H	J	K	L	M	N
UHD[T][M][X][S][R] 300	in	52.3	43.2	25.5	24.7	19.4	1.25	7.0	11.2	13.8	4.2	8.7	12.1	6.5
	(cm)	132.8	109.7	64.8	62.7	49.3	3.2	17.8	28.4	35.1	6.84	22.1	30.7	16.5
UHD[T][M][X][S][R] 350	in	52.3	43.2	25.5	24.7	19.4	1.25	7.0	11.2	13.8	4.2	8.7	12.1	6.5
	(cm)	132.8	109.7	64.8	62.7	49.3	3.2	17.8	28.4	35.1	6.84	22.1	30.7	16.5
UHD[T][M][X][S][R] 400	in	52.3	43.2	25.5	24.7	19.4	1.25	7.0	11.2	13.8	4.2	8.7	12.1	6.5
	(cm)	132.8	109.7	64.8	62.7	49.3	3.2	17.8	28.4	35.1	6.84	22.1	30.7	16.5

16.5 General Technical Data Table

	Model	UHD[T][M][X][S][R] 300	UHD[T][M][X][S][R] 350	UHD[T][M][X][S][R] 400
Full Load Amps @ 120 V	A	2	6	6
Minimum Air Volume	CFM	2700	3120	3420
Temperature Rise @ Minimum Air Volume	°F (°C)	86 (47)	86 (47)	86 (47)
Heat Exchanger Pressure Drop @ Minimum Air Volume	in wc	0.02	0.03	0.04
Maximum Air Volume	CFM	10200	13600	14200
Temperature Rise @ Maximum Air Volume	°F (°C)	23 (13)	22 (12)	22 (12)
Heat Exchanger Pressure Drop @Maximum Air Volume	in wc	0.27	0.48	0.53
Flue Size*	in (cm)	4 - All Models (10)		
Air Intake*	in (cm)	5 (13)	5 (13)	5 (13)
Duct Size (Width)	28 (71)	35 (89)	35 (89)	35 (89)
Duct Size (Height)	24 (61)	40.5 (103)	40.5 (103)	40.5 (103)
Weight (Net)	lb (kg)	325 (147.4)	345 (156.5)	345 (156.5)

** Do not exceed the maximum length of flue stated or heater may not operate properly.*

16.6 Technical Data Table

	Model	UHD[T][M][X][S][R] 300	UHD[T][M][X][S][R] 350	UHD[T][M][X][S][R] 400
Total Input High Fire	(Btu/h) x (1000)	300	350	385
Total Input Low Fire	(Btu/h) x (1000)	210	245	269.5
Total Output High Fire	(Btu/h) x (1000)	246	287	315.7
Total Output Low Fire	(Btu/h) x (1000)	172.2	200.9	221
Efficiency	%	82	82	82
Natural Gas Data - Inlet Pressure 5.0 in wc Min., 14 in wc Max.				
Burner Pressure High Fire	in wc	3.9	4.0	3.3
Burner Pressure Low Fire	in wc	1.8	1.8	1.4
LPG / Propane Data - Inlet Pressure 12.0 in wc Min., 14 in wc Max.				
Burner Pressure High Fire	in wc	10.0	8.7	10.7
Burner Pressure Low Fire	in wc	4.9	4.2	5.1

SECTION 17: THE ROBERTS GORDON® UHD-SERIES WARRANTY

ROBERTS-GORDON LLC WILL PAY FOR:

Within 24 months from date of purchase by buyer or 27 months from date of shipment by Roberts-Gordon LLC (whichever comes first), replacement parts will be provided free of charge for any part of the product which fails due to a manufacturing or material defect.

Roberts-Gordon LLC will require the part in question to be returned to the factory. Roberts-Gordon LLC will, at its sole discretion, repair or replace after determining the nature of the defect and disposition of part in question.

ROBERTS GORDON® Replacement Parts are warranted for a period of 18 months from date of shipment from Roberts-Gordon LLC or the remaining ROBERTS GORDON® UHD-Series warranty.

ROBERTS-GORDON LLC WILL NOT PAY FOR:

Service trips, service calls and labor charges.

Shipment of replacement parts.

Claims where the total price of the goods have not been paid.

Damage due to:

- Improper installation, operation or maintenance.
- Misuse, abuse, neglect, or modification of the ROBERTS GORDON® UHD-Series in any way.
- Use of the ROBERTS GORDON® UHD-Series for other than its intended purpose.
- Incorrect gas or electrical supply, accident, fire, floods, acts of God, war, terrorism, or other casualty.
- Improper service, use of replacement parts or accessories not specified by Roberts-Gordon LLC.
- Failure to install or maintain the ROBERTS GORDON® UHD-Series as directed in the Installation, Operation and Service manual.
- Relocation of the ROBERTS GORDON® UHD-Series after initial installation
- The use of the ROBERTS GORDON® UHD-Series in a corrosive atmosphere containing contaminants.
- The use of the ROBERTS GORDON® UHD-Series in the vicinity of a combustible or explosive material.
- Any defect in the ROBERTS GORDON® UHD-Series arising from a drawing, design, or specification supplied by or on behalf of the consumer.
- Damage incurred during shipment. Claim must be filed with carrier.

WARRANTY IS VOID IF:

The ROBERTS GORDON® UHD-Series is not installed by an contractor qualified in the installation and service of gas-fired heating equipment.

You cannot prove original purchase date and required annual maintenance history.

The data plate and/or serial number are removed, defaced, modified or altered in any way.

The ownership of the ROBERTS GORDON® UHD-Series is moved or transferred. This warranty is nontransferable.

Roberts-Gordon LLC is not permitted to inspect the damaged controller and/or component parts.

READ YOUR INSTALLATION, OPERATION AND SERVICE MANUAL

If you have questions about your controller, contact your installing professional. Should you need Replacement Parts or have additional questions, call or write Roberts-Gordon LLC:

Roberts-Gordon LLC
1250 William Street
P.O. Box 44
Buffalo, New York 14240-0044
Telephone: +1.716.852.4400
Fax: +1.716.852.0854
Toll Free: 800.828.7450
www.robertsgordon.com
www.rg-inc.com

Roberts-Gordon LLC's liability, and your exclusive remedy, under this warranty or any implied warranty (including the implied warranties of merchantability and fitness for a particular purpose) is limited to providing replacement parts during the term of this warranty. Some jurisdictions do not allow limitations on how long an implied warranty lasts, so this limitation may not apply to you. There are no rights, warranties or conditions, expressed or implied, statutory or otherwise, other than those contained in this warranty.

Roberts-Gordon LLC shall in no event be responsible for incidental or consequential damages or incur liability for damages in excess of the amount paid by you for the ROBERTS GORDON® UHD-Series. Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, so this limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from jurisdiction to jurisdiction.

Roberts-Gordon LLC shall not be responsible for failure to perform under the terms of this warranty if caused by circumstances out of its control, including but not limited to war, fire, flood, strike, government or court orders, acts of God, terrorism, unavailability of supplies, parts or power. No person is authorized to assume for Roberts-Gordon LLC any other warranty, obligation or liability.

LIMITATIONS ON AUTHORITY OF REPRESENTATIVES:

No representative of Roberts-Gordon LLC, other than an Executive Officer, has authority to change or extend these provisions. Changes or extensions shall be binding only if confirmed in writing by Roberts-Gordon LLC's duly authorized Executive Officer.

ROBERTS GORDON
Warm Air Heating

OWNER WARRANTY REGISTRATION CARD

Mail or Fax to:

Roberts Gordon LLC • 1250 William Street, P.O. Box 44 • Buffalo, NY 14240-0044 • Phone: +1.716.852.4400 • Fax: +1.716.852.0854
Toll Free: 800-828-7450 • www.robertsgordon.com • www.rg-inc.com

About the Owner:

Name:_____

Address:_____City:_____State:_____Zip Code:_____

Phone:_____ Fax:_____ E-mail:_____

About the Installer:

Name:_____

Address:_____City:_____State:_____Zip Code:_____

Phone:_____Fax:_____E-mail:_____

Purchased From (if different than installer):

Name:_____

Address:_____City:_____State:_____Zip Code:_____

Phone:_____ Fax:_____ E-mail:_____

About your Heater:

Model#:_____ Serial #:_____ Fuel:_____Installation Date:_____

Type of Installation (check one):

o Automotive	o Manufacturing	o Warehouse	o Recreational	o Aircraft
o Public Building	o Office	o Retail	o Agricultural	o Other_____

Installation Code and Annual Inspections: All installation and service of ROBERTS GORDON® equipment must be performed by a contractor qualified in the installation and service of equipment sold and supplied by Roberts-Gordon LLC and conform to all requirements set forth in the ROBERTS GORDON® manuals and all applicable governmental authorities pertaining to the installation, service, operation and labeling of the equipment. To help facilitate optimum performance and safety, Roberts-Gordon LLC recommends that a qualified contractor conduct, at a minimum, annual inspections of your ROBERTS GORDON® equipment and perform service where necessary, using only replacement parts sold and supplied by Roberts-Gordon LLC.

Further Information: Applications, engineering and detailed guidance on systems design, installation and equipment performance is available through ROBERTS GORDON® representatives. Please contact us for any further information you may require, including the Installation, Operation and Service Manual.

These products (with the exception of the models UHA[X][S] 30 - 75) are not approved for residential use.

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Printed in the U.S.A.

Attach this information to the wall near the ROBERTS GORDON® heater

ROBERTS GORDON®

Read the Installation, Operation and Service Manual thoroughly before installation, operation or service.

OPERATING INSTRUCTIONS

1. STOP! Read all safety instructions on this information sheet.
2. Open the manual gas valve in the heater supply line.
3. Turn on electric power to the heater.
4. Set the thermostat to desired setting (above ambient temperature). The automatic starting sequence begins.

TO TURN OFF THE HEATER

1. Turn the thermostat/time switch to 'OFF' or lowest setting. The burner will turn 'OFF' immediately, but fans will continue to cool heat exchanger until the fan thermostat switches off.

IF THE HEATER WILL NOT OPERATE, TO ENSURE YOUR SAFETY, FOLLOW THESE INSTRUCTIONS TO SHUT DOWN YOUR HEATER

1. Set the thermostat to off or the lowest setting.
2. Turn off electric power to the heater.
3. Turn off the manual gas valve in the heater supply line.
4. Call your installer/contractor qualified in the installation and service of gas-fired heating equipment.

⚠ WARNING

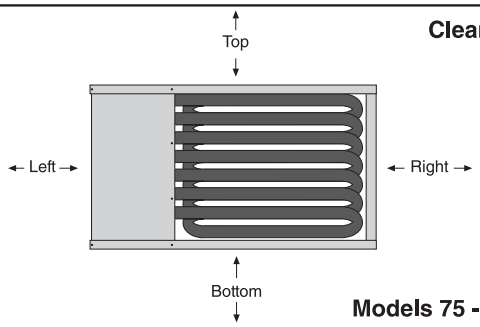
Fire Hazard

Keep all flammable objects, liquids and vapors the minimum required clearances to combustibles away from air handler.

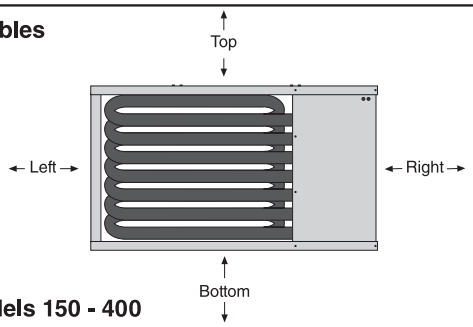
Some objects can catch fire or explode when placed close to heater.

Failure to follow these instructions can result in death, injury or property damage.

Clearances to Combustibles



Models 75 - 125



Models 150 - 400

Models	75 - 125	150 - 400
Top	1" (2.5 cm)	6" (15 cm)
Bottom	1" (2.5 cm)	6" (15 cm)
Right	1" (2.5 cm)	31"* (79 cm)*
Left	23" (58.4 cm)*	6" (15 cm)
Vent	2" (5 cm)	2" (5 cm)

* Clearance needed for servicing.

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For installation at elevations above 2000' (610m), the appliance shall be derated 4% for each 1000' (305m) of elevation above sea level.

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